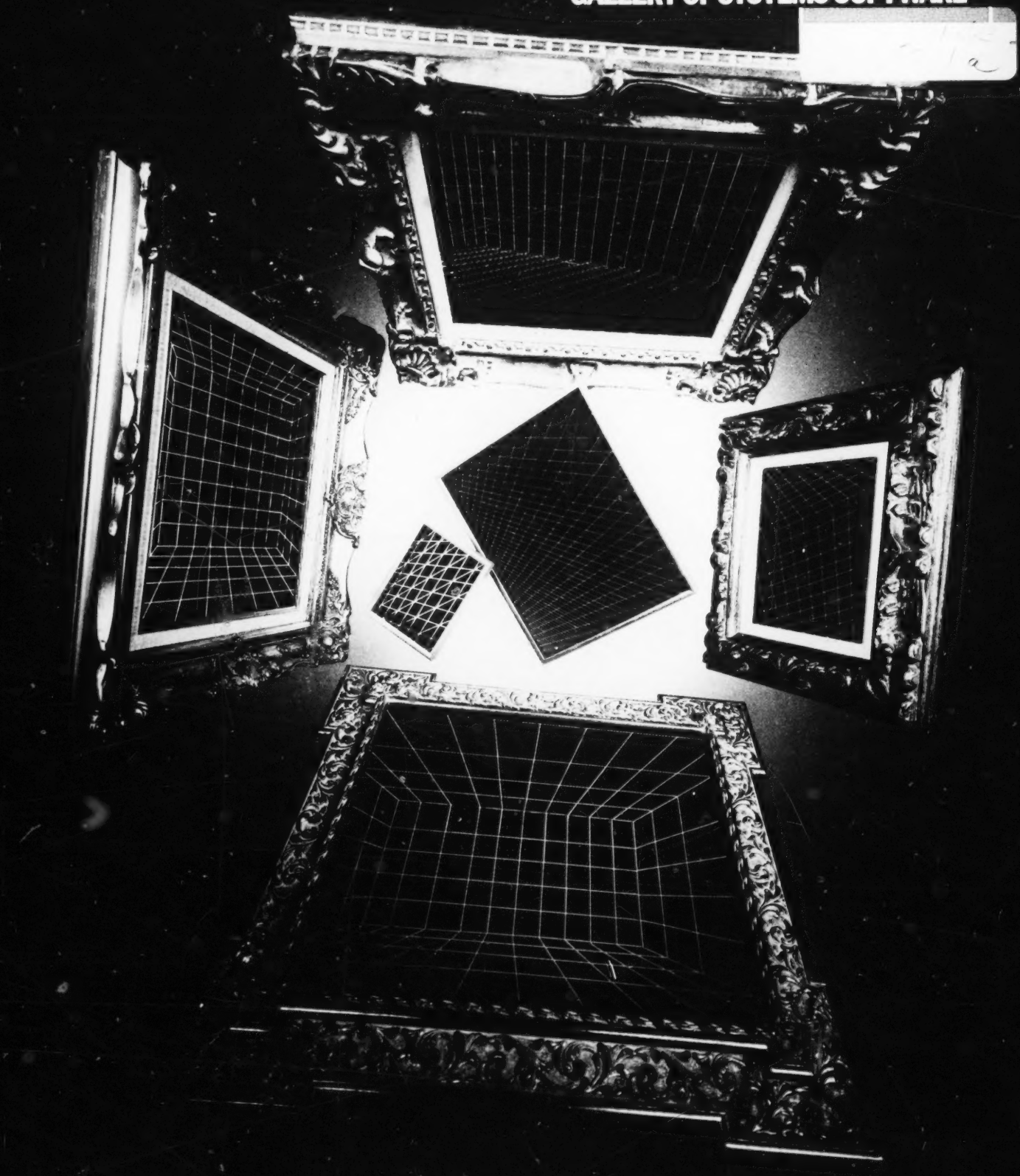
DATAMATION 83®

INTERNATIONAL OEM EDITION . DECEMBER 4.00 U.S.A.

GALLERY OF SYSTEMS SOFTWARE



DATAMATION®

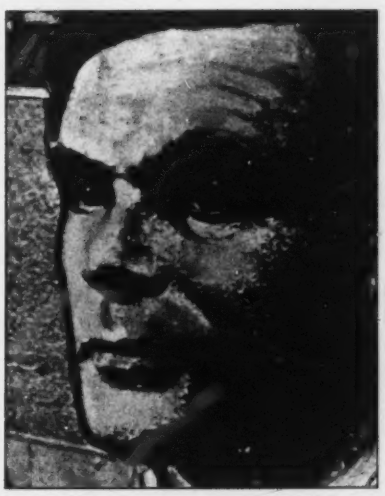
DECEMBER 1983/$4.00 U.S.A.
VOLUME 29 NUMBER 12
This issue, 176,285 copies

FEATURES

30
IN FOCUS
Which PC deserves to print out "I feel pretty"? Industrial designer Marc Harrison has the answer in "Mirror, Mirror, on the Wall."

104
SYSTEMS SOFTWARE SURVEY
Data Decisions
The pictures at the exhibition were packages, the critics were more than 5,000 users, and the reviews were mostly good.

152
ALAN TURING: THE ENIGMA
Andrew Hodges
An excerpt from the new book about the unsung, unfathomed father of programming.



178
DP CAREER PATHS
Kate M. Kaiser
Frustrations and opportunities for systems professionals abound in a field with no clear roads to advancement.

193
WINNERS AND LOSERS IN THE FIFTH GENERATION
Frederic G. Withington
Predictions concerning the futures of four of the major information technologies.

212
THE POLITICS OF SYSTEMS
Samuel H. Solomon
Dp managers must attend to machinations as well as machines.

220
PAIRING FOR THE FUTURE
Edwin R. Coover
Although X.25 and SNA are very different, they'll be a double standard for datacom in the '80s.

235
THE SOFTWARE REHEARSAL
John G. Seddon
User participation and live data help prepare a business for installation of a new package.

240
END-USER GAME PLAN
Hugh Ryan
Suggestions for making the user's computing environment friendly and productive.

NEWS IN PERSPECTIVE

46 **USERS' CONCERNS**
Honeywell opts for NEC.
Avoiding local loops.

55 **SOFTWARE**
Comserv does its books.
ADAPSO in the desert.

71 **DISTRIBUTED PROCESSING**
Who believes in heros?
IBM ponders Unix.

82 **OFFICE AUTOMATION**
IBM targets OA.

88 **GOVERNMENT**
Going too far.

99 **EFTS**
Is real POS coming?

100 **BENCHMARKS**

DEPARTMENTS

8 **LOOKING BACK**
13 **LOOK AHEAD**
18 **CALENDAR**
23 **LETTERS**
29 **EDITORIAL**
Painting the world blue.

247 **PEOPLE**
251 **HARDWARE**
267 **SOFTWARE & SERVICES**
281 **SOURCE DATA**
292 **ADVERTISERS' INDEX**
300 **MARKETPLACE**
304 **ON THE JOB**
309 **READERS' FORUM**

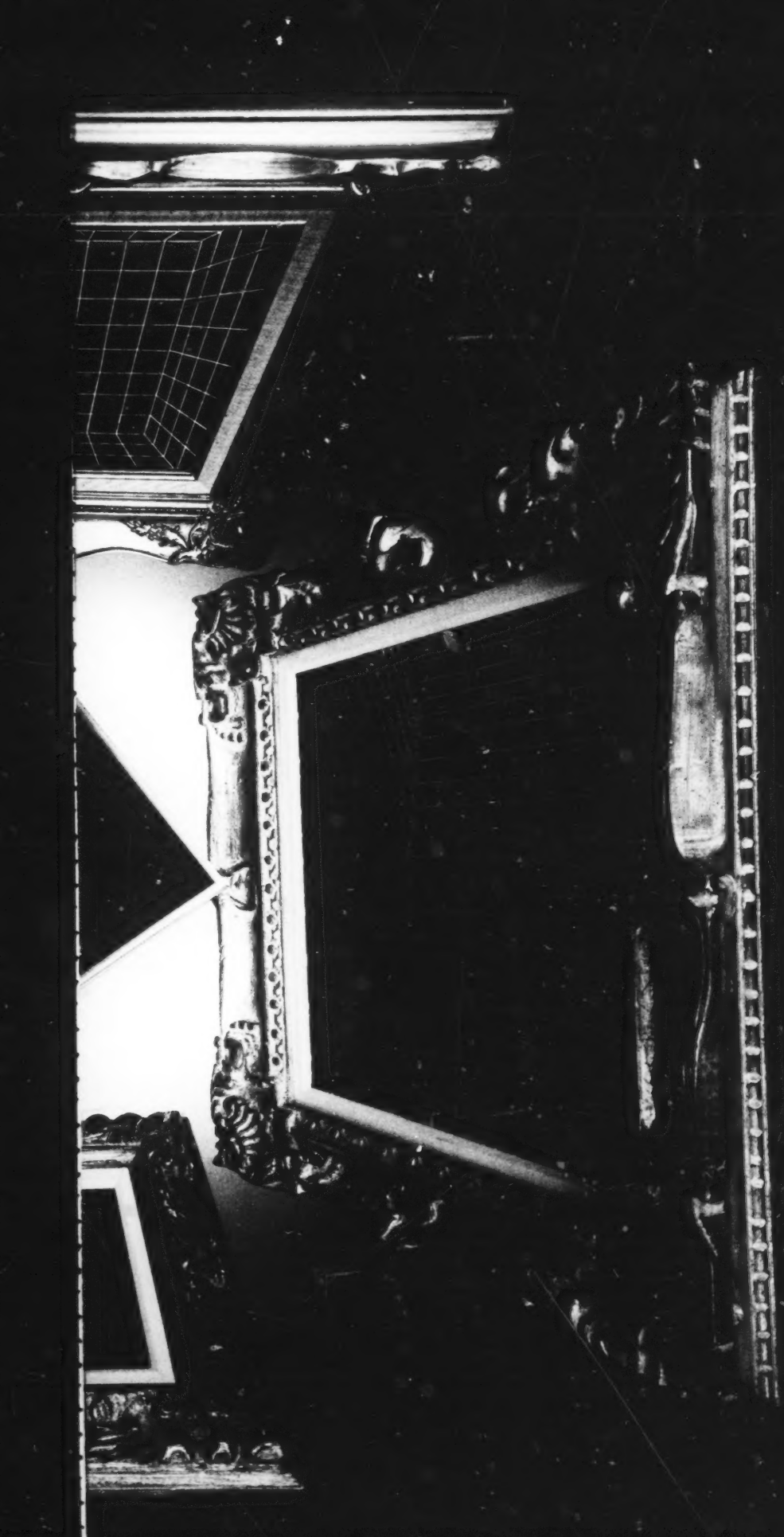
INTERNATIONAL 246-1

- 3 **HOLD THE PHONE**
-11 **LOCAL AREA SETBACKS**
-15 **BUSINESS COMMUNICATIONS' BRAVE NEW WORLD**
-24 **JAPAN'S DIGITAL DRIVE**
-29 **TELECOM 83 —TRENDS AND TOPICS**
-32 **PRODUCT SPOTLIGHT**

OEM SUPPLEMENT 247-1

- 3 **1984 MARKET FORECAST**
-11 **THEY'D RATHER SWITCH THAN FIGHT**
-21 **IMPORTANCE OF HIGH TOUCH**

COVER PHOTOGRAPH BY ROBERTO BROSAN



Users who made purchases from the gallery of systems software gave enthusiastic reviews of package performance and support.

SYSTEMS SOFTWARE SURVEY

by Data Decisions

Most systems software vendors are meeting the needs of their users and are maintaining their products with a high degree of technical competence, according to a new survey of systems software users. Group averages, on an ascending scale of 1 to 10, ranged from 6.8 to 7.5 for the six product categories and 5.9 to 6.7 for vendor support; the overall product average was 7.1, and the overall support average score was 6.4. Respondents said about 15% of the currently installed packages would be replaced, for a variety of reasons such as the purchase of new computer hardware or the need to upgrade the system; 79% judged the packages "outstanding."

The ratings are based on a survey taken earlier this year. Software consultants at Data Decisions, of Cherry Hill, N.J., polled thousands of data processing department managers, asking them to rate their systems software. In total, 5,171 users responded, offering their opinions and experiences on the performance of 106 packages and their vendors (see Methodology, p. 116.) Six types of systems software were included in the survey: utilities and OS enhancements, programming aids, monitoring aids, DBMS, query and report writers, and communications.

Users were questioned on the package's performance, day-to-day operational details such as security and vendor support, and to what degree the system's performance matched the claims made by its vendor. Suppliers will be relieved to hear

Support for communications packages received low ratings.

that 90% of the users reported that the packages met or exceeded the promised performance.

The SAS database management package, from SAS Inc., was the highest rated product, with a 9 out of 10. Other best of category packages, and the categories, are: Dylakor's DYL-280, with an 8.4 rating compared to other query and report writers; ADR's Vollie, with an 8.2 rating in the program development aids and utilities category; Westinghouse's WESTI, with a 7.9 for the communications category; Innovation Data Processing's Fast/Dump/Restore utility enhancement package; and Candle's Omegamon, with an 8.8 for the monitoring and performance aid category.

Product performance and vendor support ratings were consistent in all but one case. Communications software presents a paradox—the products rated 6.8 on average, but support lagged at 5.9. Many teleprocessing monitors from independent vendors no longer receive a vote of confidence, while some of the terminal support products are just starting to attract attention. Perhaps the developers of IBM compatible communications monitors have decided to leave the market to IBM and its CICS and retrench into other software product lines.

Throughout the survey, two categories consistently scored high. Utilities and monitoring aids received high ratings, 7.5 and 7.1 respectively, and no wonder. By their very nature, they are simple, straightforward, no-nonsense packages that offer the user quick installation and use. Very little training is required, documentation is usually adequate, and under normal circumstances, enough of these packages have been installed to minimize bugs and errors. Usually no special hardware is needed so the package makes no additional demands. Also, their high ratings can be explained as expected, given their limited and clearly defined capabilities.

SLIGHTLY LOWER SCORES

On the other hand, communications software usually requires special equipment and a highly trained individual to implement the package. The relative complexity of communications software, and the wide range of activities it addresses, would lead one to expect the slightly lower performance figures—group average of 6.6—that these packages received.

The popularity of monitoring and performance aids may be the result of the profusion of large IBM MVS-type systems—users have found it essential to employ control systems to optimize system resources. Monitoring products such as Candle's Omegamon, with over 500 sites, and Morino Associates' TSO/MON, with over 400 sites despite the fact that it runs only on MVS, are becoming household words in the homes of large system operators. These products must be doing the job since they are so popular.

Database management systems (DBMSs) are becoming more comprehensive than anyone had originally expected. They now include data dictionaries, query languages, maintenance and control utilities, and, in many instances, associated applications software. Vendors of these expensive systems have even set up interfaces for transaction processing on a local and/or remote basis.

Much attention has been paid to DBMS technology over the past five years. However, with the arrival of fourth generation languages and interactive development tools, the software-acquisition emphasis has shifted slightly from these large-scale products. The more popular DBMS vendors have responded to this shift and are beginning to provide micro-mainframe DBMS/DMS interfacing products. This approach has already been implemented by ADR and Cullinet. Relational versions of the more popular nonrelational DBMSs will also become more prevalent as the user-friendly (albeit resource intensive) nature of the relational system becomes more accepted.

In this survey data management and database management systems were combined in the same category. There may be some who feel that data management systems are less sophisticated, and in some instances this may be true. The data management systems of today, however, are much more complex than many people think. In fact, it is often difficult to determine where the data management function ends and the database management function begins.

While DBMS vendors are modifying their products to meet changing needs, standalone query and report writer systems are finding it difficult to compete both with DBMSs and with new application development tools now being introduced. Not too many years ago, every sophisticated data processing installation had its favorite query/report writer system, but, as users moved to a centralized processing environment, the capabilities of these products were incorporated into totally integrated systems. Coupled with this, new application development tools encourage people without data processing backgrounds to start programming reports that had previously been done by the dp department. The introduction of the microcomputer, with its spreadsheet packages and other programming tools for the nontechnical user, has all but stolen the glamour from the standalone query/report writer systems. In many cases, vendors have integrated these older products into other packages in their product line and sold them as a unit.

Copy routines, file reconstruction routines, sort programs, and other utilities are the backbone of every reasonably-sized data shop. There are companies that have enjoyed great success marketing only these packages, and as long as we use complex and sophisticated operating systems, they will continue to be in much demand. Their simplicity of function and ease of installation and support result in consistently higher average ratings than for any other categories. In the Data Decisions study, nine products in the utility category attained average mean scores of 8 or higher while only six products received comparable ratings in all the other categories combined.

The replacement operating system market is another story. There are relatively few replacement systems, and these too may well disappear from the scene. Aside from the very real problem of what to do with existing applications, the complexity of the IBM operating system environment makes it financially infeasible for a competitor to try to capture an appreciable market segment.

More action can be seen among products that address disk space management, library control and maintenance, and generalized data manipulation/resource management activities. They will always rate high because their limited operating capabilities are so well delineated that the user doesn't attempt anything beyond the defined scope of the product's design. These products fill today's needs, and, in the foreseeable future, they will probably remain a mainstay of the medium- to large-scale user shop.

The charts that follow indicate how the various kinds of products fared against one another in areas such as performance, vendor maintenance, and operations. User thoughts on the product and the support services overall are also included.

HOW THE PRODUCTS PERFORMED

As for specific ratings, Performance was the first addressed. Users were asked to rate, on an ascending scale of 1 to 10, their product's economy and efficiency in terms of hardware resource utilization, ease of use, freedom from program bugs and errors, and the time required for initial installation. With 1 representing the lowest and 10 the highest score, the average performance composite for all packages was 7.0. However, because the six categories differ significantly in terms of function, sophistication, and complexity, the group averages for individual categories are more significant: utilities and operating systems enhancements had a 7.4 group average; program development aids and programming utilities received a 7.1 rating overall; monitoring and performance aids also scored a

About 30% of the communications software users said they may change vendors.

7.1; database and data management packages rang up a 6.8; query and report writers and DBMS aids, 6.6; and communications software, a 6.6.

The ratings assigned to database management and data management systems are a healthy sign that vendors are providing users with what they need. The high rating for the program development aids/programming utilities category (which includes development languages) indicates that significant performance improvements can be realized from their use.

The Vendor Support section contains responses to questions on the vendors' responsiveness to users' needs, the effectiveness of the training supplied (where training is applicable), and the quality and usability of the documentation. The composite average for all packages was 6.3. The individual group support averages were utilities and operating systems enhancements, 6.5; monitoring and performance aids, 6.4; program development aids and programming utilities, 6.3; database and data management systems, 6.2; query and report writers and DBMS aids, 6.1; and, communications software, 5.8.

Understandably, the degree of support often correlates with the complexity of the product, and this factor is evident in the results. Support for relatively simple products such as utilities is usually judged less harshly than support for more sophisticated, complex, products such as DBMSs and communications software. The operations category dealt with how well the package handled expanding processing volume, backup/recovery, and security. The average composite for all packages was 6.7. The individual group averages were utilities and operating systems enhancements, 7.2; monitoring and performance aids, 6.8; program development aids and programming utilities, 6.8; communications software, 6.4; database and data management systems, 6.4; and, query and report writer and DBMS aids, 6.3.

DBMSs and communications systems software are the major categories where backup/recovery and security are of major concern, and the relatively low ratings achieved by these types of systems should be construed as a warning signal to vendors of transaction-oriented products.

After respondents rated specific characteristics, they were asked to give an overall satisfaction rating on the package itself and on the quality of the vendor's support. They gave the products a rating of 7.1. The rating for support services, however, was only 6.4.

Utilities and operating systems enhancements received a product average of 7.5 and a support average of 6.7. Database and data management packages received a 7.1 for products and a 6.3 for support. Program development aids and programming utilities received a 7.1 for the product and a 6.4 for support. As for monitoring and performance aids, the average was 7.0 for the product and 6.5 for support. Communications software received a 6.8 and a 5.9, and query and report writers and DBMS aids received a 6.8 and a 6.2, respectively.

The survey identified four basic types of support commonly offered by software vendors: on-site support; telephone hot line; on-line support, where the user's computer is remotely hooked into a diagnostic computer at the vendor's support site; and mail. In many cases, the respondents were using more than one form.

The database/data management product from SAS Inc. had the highest rating for vendor support with an 8. It was followed by the query, report writer, and DBMS package of Dylakor, with a 7.9 rating. Runners-up for support were Vollie, from ADR, with a 7.4; Tone 3 from Tone Software, and WESTI, from Westinghouse, tied at 7.2; Fast/Dump/Restore, from Innovation Data Processing, with an 8.5; and TSO/MON, from Morino Associates, with an 8.

A total picture of how each package measured up against the average for its category and for all the products in the survey is provided by the bar graphs at the end of this article.

PHONE RESPONSE POPULAR

The most popular form of quick response support was telephone consulting, used by 90% of the respondents. Because of the high level of diagnostic expertise available at most vendor installations, this makes sense. More surprising, perhaps, is the fact that over half the respondents, 54%, still use the mails, and that their rating of this support is still relatively high, 6.1.

Another figure that could be considered surprising is the 41% response showing the use of on-site support. It is not uncommon for a vendor to assign someone from a nearby support office to attend to a large customer's needs, and vendors are trying to expand their sales and support capabilities so they can be within easy reach of any major account. Although on-site support is very expensive, users are obviously taking advantage of the proximity of available assistance. Clearly many users are willing to pay big money to deal with one person who knows the staff, the idiosyncracies of the systems, and the ins and outs of the applications it is running. And the average rating of 6.5 shows that the level of satisfaction is relatively high.

On the other hand, on-line support, a technique that several vendors (including IBM) attempted to sell to large system users, has never become particularly popular. The number of users employing it is low, only 14%. Even more important, the average rating of 5 shows that performance in this area is only "acceptable," while all other types of support were rated "very good." Some of the reasons could include the cost of establishing the original hookup, or the interface may be too complex. The lack of human interface might pose psychological problems for the customer. How many times have you hung up the phone when a machine asks you to start talking when you hear the beep?

Needless to say, certain types of software lend themselves more to one type of support than to another. As one might expect, users of the more complex software products, such as DBMSs and communications systems, were significantly more likely to use on-site support than were users of other types of products—55% versus an average of 41%.

In addition, DBMS users utilize on-line problem diagnosis at a rate of 26%—almost double that for any other type of user. The two categories with support services rated higher than the others—utilities, monitoring, and performance aids—are also the two with the lowest percentage of users utilizing on-site support.

Smart managers are always looking for products that deliver value for the dollars they spend. To determine whether our systems software users felt they had realized this goal, Data Decisions asked them to characterize the value of their packages. Overall, 49% of the users of the average package felt they had received excellent value for their investment; 35% said their package offered outstanding features, while 14% reported that the package provided good features at a low price. Respondents who felt they had acquired good value made up 43% of the response. This includes 8% who felt they had packages with outstanding features, but at a high price; 32% who said they had acquired good features at a comparable price; and 3% who reported that their acquisitions lacked features but were priced low enough to make them worthwhile. Only 4% thought their packages were poor values. This total was split equally among those who felt they had installed packages with good features, but at a very high price, and those who had installed systems that lacked necessary features and were overpriced as well.

Thus, over 90% of the respondents regarded their packages as excellent or good value for the money, and over 80% said their acquisitions contained good or outstanding features at comparable or low prices. Competition among software suppliers has had much to do with these results, but we shouldn't overlook the more educated selection processes being incorporated in many installa-

Previous experience with the same vendor doesn't count for much.

tions. This combination of competition and increasingly sophisticated buyers should keep these vendors on their toes and ensure that they continue to deliver the types of products up-to-date users demand at a price that is fair and equitable.

Every data processing manager has been involved in a software package selection process. During this exercise, much time is spent listening to salespeople describe what the company needs and how the package will meet those needs. Sometimes, however, after the sale has been made, the salesperson has to rush back to the development site and prod the resident genius into figuring out how to modify the product to meet the claims. If the customer is lucky, the modifications are made with little or no effect on the installation. In some instances, however, the modifications are never done, or they have an undesirable effect on the performance of the package. To help clarify this problem, respondents were asked to judge whether three areas of package performance exceeded, met, or failed to meet vendor promises. The response was overwhelmingly positive. Installation time exceeded promises in 9% of the cases; met promises, 81%; and did not meet promises, 6%. As for features and capabilities, the packages exceeded promises 9%, delivered 83% of the time, and failed 5%. In performance, speed, and efficiency, the rates were 8%, 81%, and 7%, respectively.

PACKAGES FULFILLED PROMISES

With over 90% reporting that their packages either met or exceeded the performance promised by the vendor, the chance of a major mismatch based on promised capability seems far less likely today than it was in previous years.

Although the responses from users of all six types of packages closely followed the percentages reported for the overall survey, some interesting deviations occurred. For example, the percentage of respondents who said their products did not meet promises in terms of performance was higher in the database/data management group than in any other (12%), and users of query/report writer/DBMS aids felt almost the same way (10%). Ten percent of the communications software users responding to this question reported that their acquisitions did not meet vendor promises when it came to installation time. Again, we see that the more complex software entities carry with them high expectations but less-than-expected results.

To determine how much influence various factors have on the selection process, users were asked about seven points of consideration likely to come into play during the selection process. Then they were asked questions that explored pre- and postacquisition procedures. Finally, users explained why they were thinking of replacing their packages.

The capability and features of the package were cited as the major influence by 81% of those polled, with 10% considering features a minor influence and 3% responding with no influence. Productivity and ease of use were cited as a major influence by 66%, with 22% saying "minor influence" and 6% saying "no influence." Compatibility was a major influence for 60%, a minor influence for 20%, and of no influence for 14%. Vendor presence and reputation is less of a factor than everyone assumes—37% say it is a major influence, 41% say it is a minor influence, and 16% say it has no influence. The costs and implementation time is a major consideration for 30%, a minor influence for 41%, and of no influence for 22%. Prior experience with the vendor is a major influence for 20%, a minor influence for 18%, and of no influence to the majority, 55%. The least important influence is advice from others—13% say a recommendation is a major influence, 18% say it is likely to be a minor influence, and 62% say a good word from a third party is of no influence.

It seems likely that a good experience with a vendor with whom one has had previous dealings would carry more weight than the 55% "no influence" rating, but today's better informed users don't seem to let past experiences influence current selection processes. This means that vendors continually have to prove themselves and their products.

Although most of the percentages within the six groups followed patterns similar to those shown in the overall breakdown, there were some interesting deviations. In the monitoring and performance group, 88% of those answering the question felt that specific features and capabilities were of the utmost importance. This was a solid 7% greater than the average and may indicate that, when selecting this type of package, the user has well-defined expectations concerning improvement and is looking for features that will deliver these capabilities.

A rousing 22% of the respondents rating database/data management packages indicated that software compatibility had no influence on their selection. This is not too strange, when one considers that installing a DBMS normally implies that new applications would have to be written to accommodate it.

Finally, 73% of the respondents rating program development aids indicated that productivity and ease of use were the major influences governing their decision. This high percentage was balanced by a low of 56% in the monitor and performance aids group who felt that ease of use was of major importance. The very nature of the user-friendly software promised by most developers of these tools probably accounts for the 7% above average figure, while the users of fine-tuning tools expect specialists to interpret the results and are not necessarily looking for ease of use. Also, monitors and performance aids are not directly involved in productivity, only indirectly as a result of the analyses performed by them.

61% SAW OTHER PACKAGES

How many of us go out and buy the first item we see? Not many. Fortunately, the same holds true for most installations in the market for software products. Users were asked whether they had evaluated alternative packages, from either the computer manufacturer or independent software vendors, before acquiring the package being rated, and to indicate the number of prior reviews in both cases. It turned out that 61% had evaluated alternative packages; 33% had evaluated an average of 1.6 packages from computer manufacturers; and 50% had evaluated an average of 2.5 packages from independents.

Historically, independent software suppliers have provided more efficient, less expensive, and generally more effective alternatives to the manufacturers' products. The poll indicates that this is still true. It appears that, in the communications software area, computer manufacturers are actively competing with the independents—44% of the users checked out vendor alternatives. On the other hand, independent utilities and report writers seem to be clear favorites, with 50% and 58% of the users evaluating their alternatives—a trend that has been observed for many years. The monitoring and performance aids marketplace has been dominated historically by independent software suppliers such as Boole & Babbage, Morino Associates, and, more recently, by companies such as Candle, so there is less evaluation of alternatives in this area—only 52% of the users—than in any other. This is undoubtedly because the technology is relatively new, and there are relatively few independent vendors.

The growth of software technology is so dynamic that one must continually compare packages being used against those that have become available since their acquisition. As for postacquisition evaluation, it turned out that 22% had evaluated alternative packages after acquisition; 9% had evaluated an average of 1.3 packages from manufacturers; and 14% an average of 2.1 packages from independents. Thus, almost a quarter of the respondents are involved in some form of postacquisition review, and they seem to be looking more toward the independents than to manufacturers for possible replacements. Of course the reason for this might be that most

The overwhelming majority—91%—of packages are still supported by the original vendor.

users bought the manufacturer's package originally, and therefore have to seek an alternate elsewhere.

When asked whether they are thinking of replacing their packages, 15% said yes, with 5% citing the need for features not available in the current package. Four percent indicated that they were upgrading or changing to a new computer system, 2% claimed that execution speed was too slow, 2% claimed that the package was generally unsatisfactory, and 1% claimed that it would cost too much to upgrade or expand the current package.

Why this general lack of activity? For one thing, software packages for mainframes and many minis can be a big investment, even for a large dp installation. When a user spends over $100,000 for a database management system and many thousands more on implementation, application development, and other tasks, there is going to be great hesitance about replacing it. This might be one reason why relatively few are considering replacement, though many users are examining their options.

Another reason might be that, in many cases, the increasing speed of hardware compensates for certain throughput concerns that might have existed earlier. Finally, the low percentage of respondents considering replacement for generally unsatisfactory performance could be interpreted as a plus for the science of initial package selection. Don't forget, however, that the longer a package is installed in a production environment, the more dependent the operations become on that package since changing systems or operating system environments can involve great effort and cost.

A significant statistic reflected in the individual bar charts is that 30% of the communications software respondents indicated that they were considering changing their packages. This figure exceeds that for any of the other groups, where the figures ranged from a low of 10% for program development aids to a high of 17% for database management packages. A possible reason could be the dynamic nature of protocol and office automation communications advancements, which necessitate constant review of existing communications hardware and software.

In light of recent mergers, acquisitions, takeovers, and general realignment of the vendor/developer marketplace, is the original vendor still supporting the package, or is it being supported by a third party or by the user's in-house staff? The overall survey response showed that the overwhelming majority—91%—of the packages are supported by the original vendor, with only 4% supported by a third party and 3% by the in-house staff.

The bar charts show the response to questions on overall satisfaction, installation and initial use, vendor service and support, and operations criteria. Graphs are presented for all 106 packages that were sampled.

The overall satisfaction-product bar encompasses factors such as satisfaction with package features, capabilities, and utility and the frequency of failures requiring extra effort for recovery. Overall satisfaction-support services reflects the user's appraisal of installation, documentation, modification, and training support.

The bar labeled performance reflects economy/efficiency factors such as hardware resource utilization, ease of use, freedom from bugs/errors, and time required for the initial installation. The bar labeled vendor support gauges the vendor's responsiveness to user needs, effectiveness of training, and quality of documentation. The operations bar is a measure of the package's ability to handle expanding processing volumes, backup/recovery, and security.

Note: In split-bar presentations, the solid bar indicates package scores and the open bar the common group average.

Ratings Summaries

DATABASE/DATA MANAGEMENT PACKAGES—23 packages studied.

Mean Score

9.0—SAS Inc. SAS
8.0—Software House System 1022
7.9—Burroughs Corp. DMS-II
7.8—Hewlett-Packard Image
7.7—Cullinet IDMS, Information Builders Focus, Software AG ADABAS
7.1—Group Average, ADR Datacom/DB, Cincom Total, Mathematica RAMIS II
7.0—Henco INFO, Honeywell DM-IV
6.9—Infodata Inquire
6.8—Sperry DMS-1100, Tominy Data Base Plus
6.7—National Information Systems DPL
6.6—Oceanic Systems Extracto
6.5—IBM IMS/DB, Intel System 2000
6.4—Advanced Data Management DRS
6.1—Applications Software Inc. ASI-ST, IBM SQL/DS
5.7—IBM DL/1 DOS/VS

QUERY/REPORT WRITERS/DBMS AIDS—13 packages studied.

Mean Score

8.4—Dylakor DYL-280
7.9—Dylakor DYL-260
7.2—Cullinet EDP Auditor/Culprit
7.1—Manager Systems Products (MSP) Datamanager, Pansophic Easytrieve
6.9—H&M Systems Keyfast
6.8—Group Average, Computer Associates CA-EARL, University Computing UCC TEN
6.6—TSI Int'l. Key/Master
6.5—ADR Datadictionary
6.1—TSI Int'l. Data Analyzer
5.7—TSI Int'l. Data Catalogue 2
5.4—Informatics General Inquiry/IV

PROGRAM DEVELOPMENT AIDS/ PROGRAMMING UTILITIES—13 packages studied.

Mean Score

8.2—ADR Vollie
8.0—On-Line Software Int'l. Intertest
7.8—Altergo Quota II
7.5—Cincom Mantis, IMSL Inc. IMSL Libraries
7.4—Pansophic O-W-L, Software AG Natural
7.1—Group Average
7.0—Oxford Software UFO
6.8—Altergo CPG
6.4—ADR METACOBOL
6.3—Informatics General Mark IV
5.4—ADR Autoflow II

COMMUNICATIONS SOFTWARE—13 packages studied.

Mean Score

7.9—Westinghouse WESTI
7.6—Tone Software Tone 3
7.5—Altergo Shadow II
7.4—ADR Roscoe
7.3—Burroughs NDL
6.9—IBM CICS/VS
6.8—Group Average, IBM IMS/DC, Software AG COM-PLETE
6.7—Cincom Environ/1
6.6—IBM ICCF
6.2—Polygon Systems Intercomm
5.9—ADR Datacom/DC
4.8—TSI Int'l. Task/Master

UTILITIES/OPERATING SYSTEMS/ ENHANCEMENTS—34 packages.

Mean Score

8.9—Innovation D.P. Fast/Dump/Restore
8.7—Corodale System/Manager
8.6—Macro 4 Logout/Multilog
8.5—Syncsort Inc. SYNCSORT, Westinghouse Disk Utilities
8.4—Cambridge Systems Group ACF2, Software Pursuits DOS/MVT/VSE
8.2—Computer Associates CA-Sort
8.1—Software Module Marketing—DMS/OS
7.9—CGA/Allen Super-MSI, Computer Associates CA-RAPS, Compuware Abend-Aid
7.7—Informatics General Shrink, University Computing UCC One
7.6—ADR the Librarian
7.5—Group Average, Computer Associates CA-DYNAM/T, Minicomputer Systems MICOS, SDI EPAT, University Computing UCC Seven

The packages in this year's survey were installed, on average, for 39 months.

7.4—Cambridge Systems Group ASM2, Computer Associates CA-DYNAM/D, Johnson Systems OS/DOS/JARS, Pansophic Panvalet, University Computing UCC Eleven
7.1—Tower Systems D/Fast
7.0—Computer Associates CA-TLMS
6.9—SDI Grasp, Tower Systems T/Fast
6.8—Johnson Systems UMAX
6.7—Nixdorf EDOS, Pace KOMAND
6.3—Computer Associates GA-Jasper, University Computing UCC Two
5.5—Computer Associates CA-Scheduler

MONITORING AND PERFORMANCE AIDS—10 packages studied.
Mean Score
8.8—Candle Omegamon
7.8—Morino Assoc. TSO/MON
7.3—ADR Look
7.2—BGS Systems Best/1
7.1—BGS Systems Capture/MVS
7.0—Group Average
6.9—Boole & Babbage Control/IMS/Realtime
6.7—Boole & Babbage TSA/PPE
6.5—Boole & Babbage CMF/Monitor, Resolve-Resolve/CICS
5.1—Value Computing Comput-A-Charge

METHODOLOGY

The survey, designed by Data Decisions, was conducted in July 1983. Packages from independent vendors were selected using the Million Dollar list from International Computer Programs, Indianapolis, as a source. Only vendors with packages identified by ICP as having grossed $5 million or more in sales were included. Packages from hardware manufacturers were included if at least 30 user sites were recorded on a database supplied by Computer Intelligence Corp., La Jolla, Calif.

Where possible, user site samplings were obtained directly from the vendor. A special delivery letter was sent to each company asking for a list of the 125 most recent customers who had had the designated package installed and running for at least six months as of June 1, 1983. If a package didn't have that many qualified users, the company was asked to supply its complete customer file. Companies were also asked to certify that the list provided actually represented their most recent customers and that they would make no attempt to contact those customers with regard to the survey. (Respondents were also asked whether they were contacted by the vendors.) A minimum of two follow-up telephone calls were made to each company to encourage it to participate. If a vendor failed to provide a site list, Data Decisions contacted the sites registered on the CI list.

The Mailing

In total, 9,961 questionnaires were sent to identified users of 108 packages during the last week of July 1983. As an incentive to respond, a $1 bill was included.

About 57%, or 5,667, of the questionnaires were returned; 105 questionnaires were undelivered by the post office. To ensure a minimum response rate of 40% and a minimum user base of 15 interviews for each package, Data Decisions conducted telephone interviews among those who didn't respond. The questionnaire used was identical, and 88 telephone interviews were completed. This brought the number of survey responses to 5,755, for an overall response rate of 58%. Seventy-four additional interviews conducted on two products resulted in less than 15 user responses per product, and these products were dropped from the survey and eliminated from the overall package totals. This brought the total response to 5,681 completed questionnaires on 106 packages.

The Questionnaire

A questionnaire was mailed to the key vendor contact at each installation, usually the data processing manager or head of the dp operation for the company. The questionnaire first qualified the respondent as a bona fide user and then explored the factors that resulted in the ratings.

Types of Packages Surveyed

This year, the packages were installed, on average, for 39 months, with a low of 31 months for monitoring and performance aids and a high of 54 months for communications software. The overwhelming majority of the packages were running on IBM machines.

Eighty percent of the respondents stated that the principal system for the package was installed on IBM. Amdahl and DEC accounted for an additional 3% each; NAS and Burroughs accounted for 2% each; and Magnuson, Sperry, Hewlett-Packard, Honeywell, Data General, Control Data, and IPL Systems each registered 1%. Adding together all the IBM-compatible systems—Amdahl, NAS, Magnuson, and IPL Systems—reveals that approximately 87% of the 106 packages in the survey run on IBM-class systems.

The packages included in this year's survey have been divided into six categories on the basis of their functions: Database/Data Management Packages, Query/Report Writers/DBMS, Program Development Aids/Programming Utilities, Communications Software, Utilities/Operating Systems/Enhancements, and Monitoring and Performance Aids. Users were asked to rate them on various capabilities, using a scale of 1 to 10, with 9 to 10 for superior, 6 to 8 for very good, 3 to 5 for acceptable, and 1 to 2 for inadequate. Entries are arranged in descending order by mean score. Although these figures give a good general indication of the relative popularity of the various packages, minute gradations should not be taken too literally. Without further investigation one would be hard put to say that a package with a score of 7.0 was definitely better than one with a score of 6.8. If the original vendor is not the current vendor of the package, the original vendor's name is shown in parentheses after the name of the current vendor.

AV. TOLERANCES FOR 68% CONFIDENCE LEVEL

	OVERALL SATISFACTION			SPECIFIC ATTRIBUTE RATINGS		
SAMPLE SIZE	6.0 or Under	7.0	8.0 or Over	6.0 or Under	7.0	8.0 or Over
60 or more	.25	.20	.15	.30	.25	.20
40 to 59	.30	.25	.20	.35	.30	.25
30 to 39	.35	.30	.25	.40	.35	.30
Under 30	.45	.30	.25	.50	.45	.35

The chances are approximately two in three that a reported rating differs by no more than the indicated tolerance from the rating that would have been obtained had all eligible sites been surveyed. For example, suppose a sample of 38 sites gives a software package rating of 7.0 for Overall Satisfaction. The table indicates a tolerance of .30 on this estimate. Thus, the chances are two in three that the interval 6.70 to 7.30 includes the rating that would have been obtained had all eligible sites been surveyed.

Ratings Values

10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

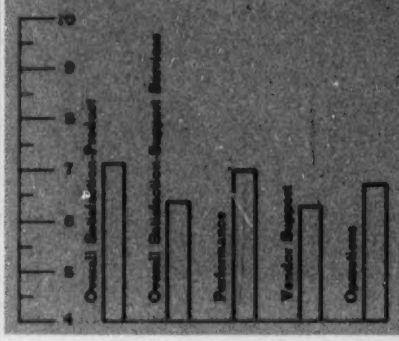
Legend

Specific Product Rating
Group Average Rating

OVERALL SUMMARY

Average—All Packages • 106 packages

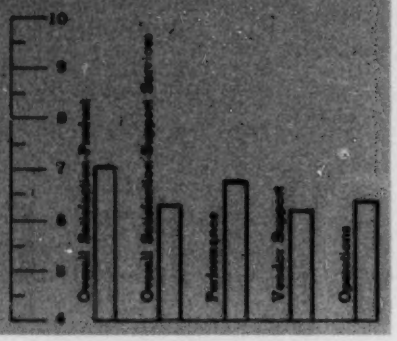
8,171 responses • 79% judged package and 66% judged vendor outstanding • 15% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



DATABASE/DATA MANAGEMENT PACKAGES

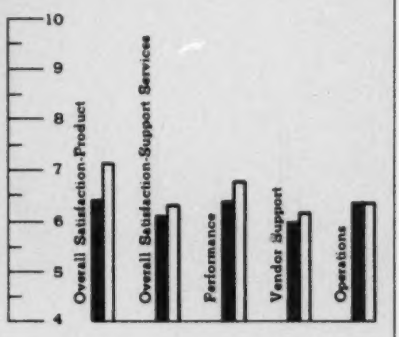
Group Average • 23 packages

1,089 responses • 77% judged package and 64% judged vendor outstanding • 17% actively seeking to replace package, with 3% citing unsatisfactory performance as reason.



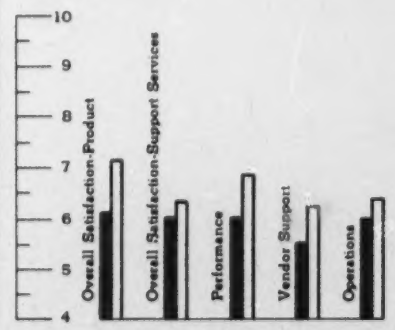
DRS • Advanced Data Management, 15-17 Main Street, Kingston, NJ 08528 • 609-799-4600

39 responses • 67% judged package and 49% judged vendor outstanding • 21% actively seeking to replace package, with 8% citing unsatisfactory performance as reason.



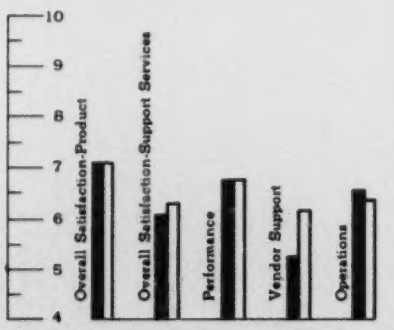
ASI-ST • Applications Software, Inc., 21515 Hawthorne Bldv., Torrance, CA 90503 • 213-540-0111

16 responses • 63% judged package and 69% judged vendor outstanding • 25% actively seeking to replace package, with 12% citing unsatisfactory performance as reason.



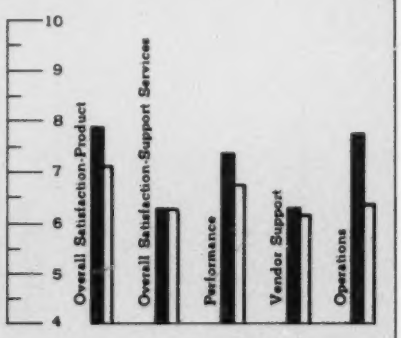
ADR/DATACOM/DB • Applied Data Research, Rt. 206 & Orchard Road, CN 8, Princeton, NJ 08540 • 201-874-9100

53 responses • 79% judged package and 59% judged vendor outstanding • 17% actively seeking to replace package, with 4% citing unsatisfactory performance as reason.



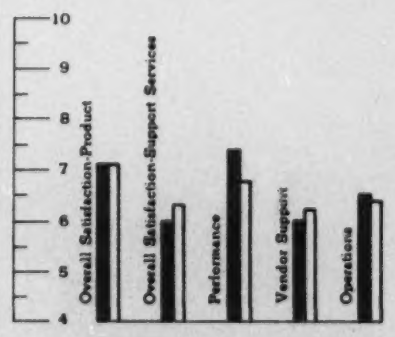
DMS-II • Burroughs Corporation, Burroughs Place, Detroit, MI 48232 • 313-972-9127

54 responses • 89% judged package and 59% judged vendor outstanding • 9% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



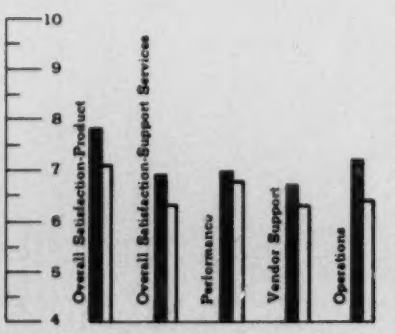
TOTAL • Cincom Systems, Inc., 2300 Montana Avenue, Cincinnati, OH 45211 • 513-662-2300

83 responses • 79% judged package and 58% judged vendor outstanding • 38% actively seeking to replace package, with 4% citing unsatisfactory performance as reason.



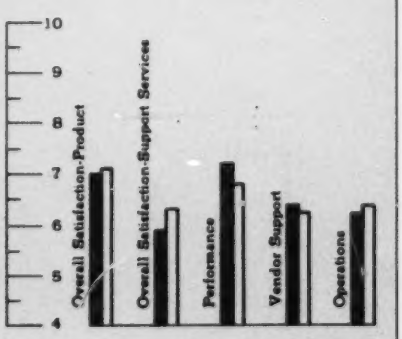
IDMS • Cullinet, 400 Blue Hill Drive, Westwood, MA 02090 • 617-329-7700

61 responses • 90% judged package and 79% judged vendor outstanding • 2% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



INFO • Henco, 100 Fifth Avenue, Waltham, MA 02154 • 617-890-8670

50 responses • 82% judged package and 60% judged vendor outstanding • 12% actively seeking to replace package, with 6% citing unsatisfactory performance as reason.



Ratings Values

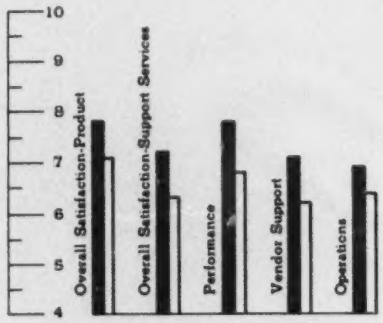
10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

Legend

Specific Product Rating
Group Average Rating

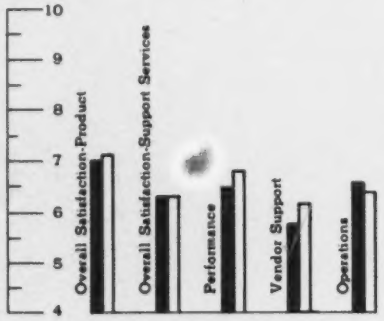
IMAGE • Hewlett-Packard Co., General Systems Division, 978 E. Arquet Avenue, Sunnyvale, CA 94086 • 408-735-1550

89 responses • 86% judged package and 76% judged vendor outstanding • 5% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



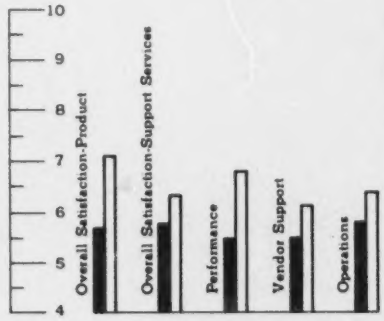
DM-IV • Honeywell Information Systems, Inc., 200 Smith Street, Waltham, MA 02154 • 617-890-8400

29 responses • 72% judged package and 59% judged vendor outstanding • 24% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



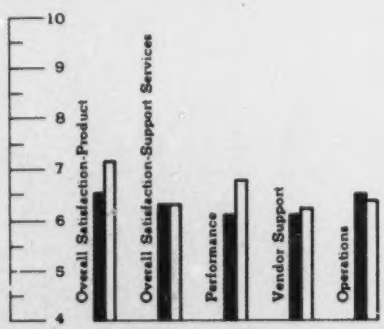
DL/1 DOS/VS • IBM, National Accounts Division, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900

48 responses • 56% judged package and 58% judged vendor outstanding • 27% actively seeking to replace package, with 10% citing unsatisfactory performance as reason.



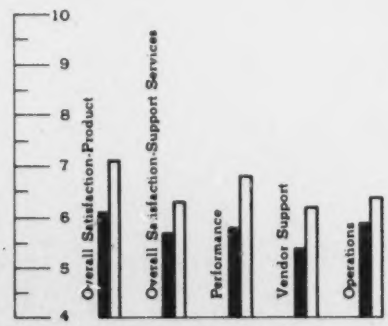
IMS/DB • IBM, National Accounts Division, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900

38 responses • 66% judged package and 54% judged vendor outstanding • 11% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



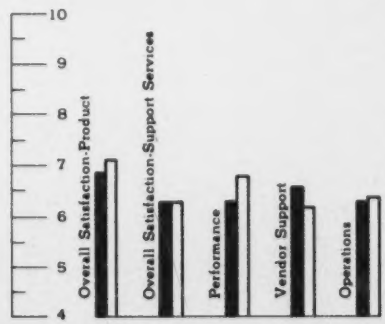
SQL/DS • IBM, National Accounts Division, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900

37 responses • 64% judged package and 60% judged vendor outstanding • 16% actively seeking to replace package, with 8% citing unsatisfactory performance as reason.



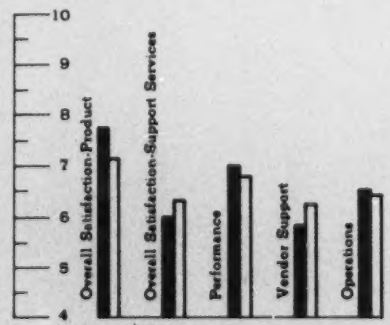
INQUIRE • Infodata Systems, Inc., 5205 Leesburg Pike, Falls Church, VA 22041 • 703-578-3430

57 responses • 75% judged package and 67% judged vendor outstanding • 10% actively seeking to replace package, with 4% citing unsatisfactory performance as reason.



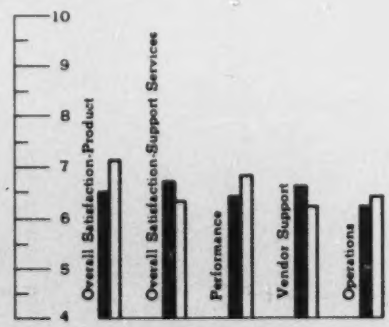
FOCUS • Information Builders, Inc., 1250 Broadway, New York, NY 10001 • 212-736-4433

58 responses • 90% judged package and 57% judged vendor outstanding • 9% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



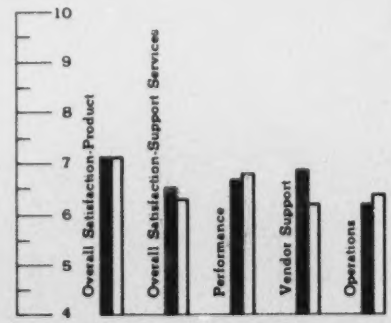
SYSTEM 2000 • Intel Corporation, 12675 Research Blvd. P.O. Box 9968, Austin, TX 73766 • 512-258-5171

51 responses • 69% judged package and 74% judged vendor outstanding • 18% actively seeking to replace package, with 6% citing unsatisfactory performance as reason.



RAMIS II • Mathematica Products Group, Inc., P.O. Box 2392, Princeton, NJ 08540 • 609-799-2600

59 responses • 83% judged package and 76% judged vendor outstanding • 8% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



Ratings Values

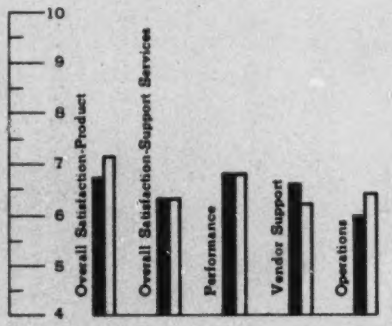
10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

Legend

Specific Product Rating
Group Average Rating

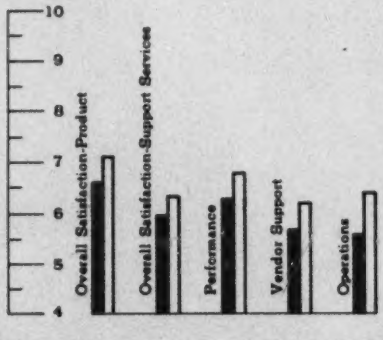
DPL • National Information Systems, Inc., 20370 Town Center Lane, Suite 130, Cupertino, CA 95014 • 408-257-7770

41 responses • 71% judged package and 51% judged vendor outstanding • 46% actively seeking to replace package, with 5% citing unsatisfactory performance as reason.



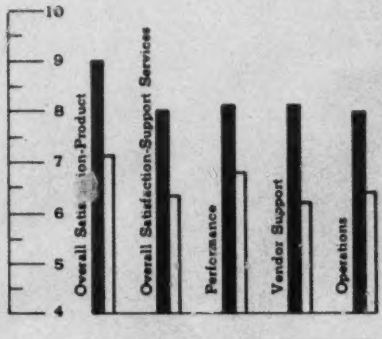
EXTRACTO • Oceanic Information Systems, Inc., 2197 Leon-Harmel, Quebec City, Quebec, Canada G1N 4N5 • 418-681-7741

23 responses • 57% judged package and 57% judged vendor outstanding • 35% actively seeking to replace package, with 9% citing unsatisfactory performance as reason.



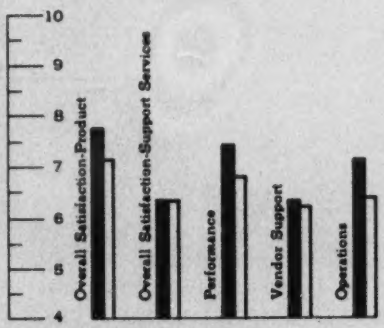
SAS • SAS Institute, Inc., SAS Circle, P.O. Box 8000, Cary, NC 27511-8000 • 919-467-8000

78 responses • 96% judged package and 88% judged vendor outstanding • 1% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



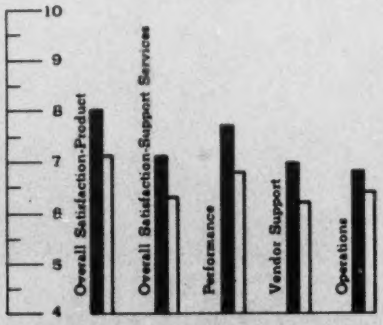
ADABAS • Software AG of North America, International Center, 11800 Sunrise Valley Drive, Suite 1517, Reston, VA 22091 • 703-860-5050

65 responses • 91% judged package and 63% judged vendor outstanding • 2% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



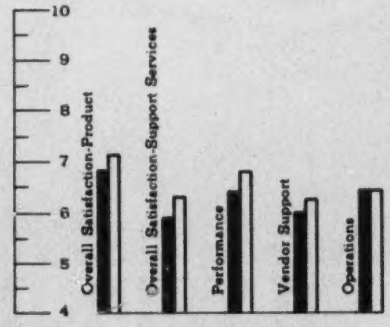
SYSTEM 1022 • Software House, 1105 Massachusetts Avenue, Cambridge, MA 02138 • 617-661-9440

61 responses • 93% judged package and 80% judged vendor outstanding • 15% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



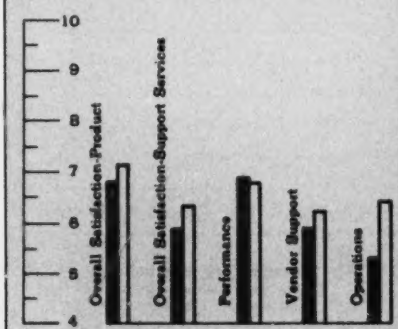
DMS-1100 • Sperry Corporation, P.O. Box 500, Blue Bell, PA 19422 • 215-542-4011

45 responses • 76% judged package and 56% judged vendor outstanding • 9% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



DATA BASE PLUS • Tominy, Inc., 4221 Malsbary Road, Building One, Cincinnati, OH 45242 • 513-984-6605

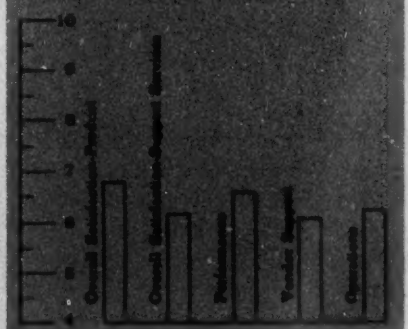
29 responses • 72% judged package and 59% judged vendor outstanding • 28% actively seeking to replace package, with 3% citing unsatisfactory performance as reason.



□ QUERY/REPORT WRITERS/ DBMS AIDS

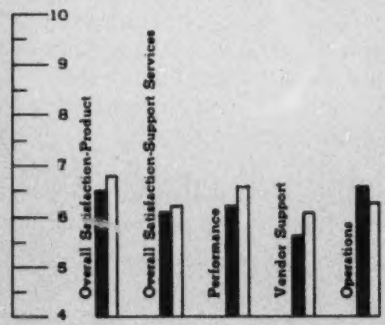
Group Average • 13 packages

478 responses • 73% judged package and 61% judged vendor outstanding • 13% actively seeking to replace package, with 3% citing unsatisfactory performance as reason.



DATA DICTIONARY • Applied Data Research, Rt. 206 & Orchard Road, CN8, Princeton, NJ 08540 • 201-874-9100

49 responses • 67% judged package and 57% judged vendor outstanding • 8% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



Ratings Values

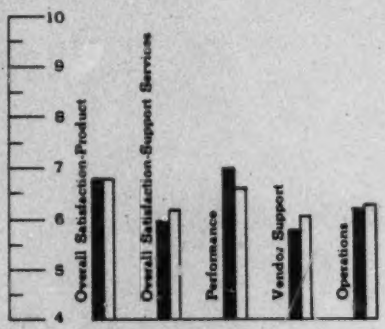
10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

Legend

Specific Product Rating
Group Average Rating

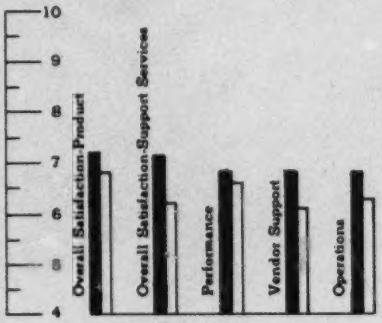
CA-EARL • Computer Associates International, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6733

53 responses • 79% judged package and 58% judged vendor outstanding • 19% actively seeking to replace package, with 6% citing unsatisfactory performance as reason.



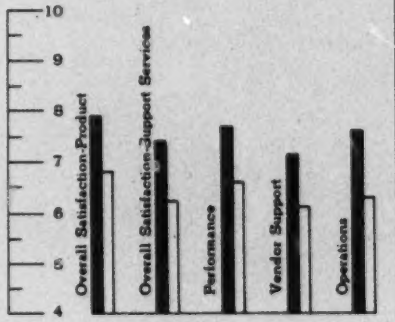
EDP AUDITOR/CULPRIT • Cullinet, 400 Blue Hill Drive, Westwood, MA, 02090 • 617-329-7700

84 responses • 79% judged package and 79% judged vendor outstanding • 4% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



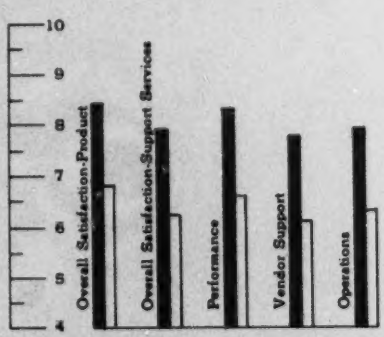
DYL-280 • Dylakor, 17418 Chatsworth Street, P.O. Box 3010, Granada Hills, CA 91344 • 213-366-1781

88 responses • 85% judged package and 80% judged vendor outstanding • 9% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



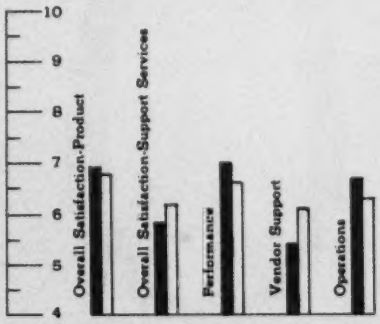
DYL-280 • Dylakor, 17418 Chatsworth Street, P.O. Box 3010, Granada Hills, CA 91344 • 213-366-1781

89 responses • 94% judged package and 90% judged vendor outstanding • 1% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



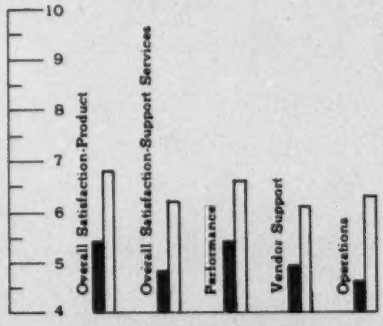
KEYFAST • H&M Systems Software, Inc., 351 Evelyn Street, Paramus, NJ 07652 • 201-599-9111

71 responses • 79% judged package and 51% judged vendor outstanding • 6% actively seeking to replace package, with 1% citing unsatisfactory performance as reason.



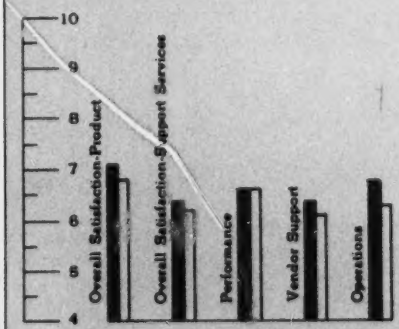
INQUIRY/IV • Informatics General Corp., 9441 LBJ Freeway, Dallas, TX 75243 • 214-231-1400

33 responses • 36% judged package and 24% judged vendor outstanding • 21% actively seeking to replace package, with 9% citing unsatisfactory performance as reason.



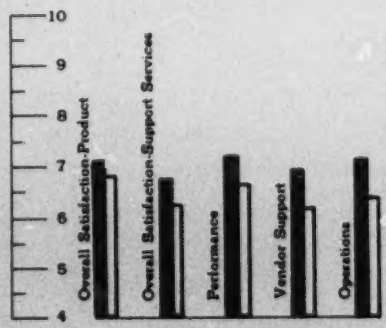
DATA MANAGER • MSP, Inc., 131 Hartwell Avenue, Lexington, MA 02173 • 617-861-6130

63 responses • 84% judged package and 72% judged vendor outstanding • 6% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



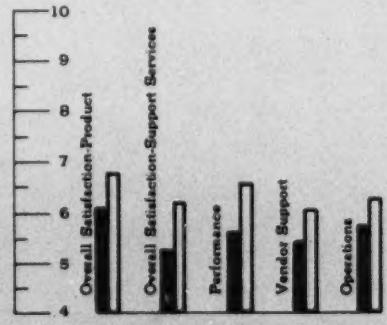
EASYTRIEVE • Pansophic Systems, Inc., 709 Enterprise Drive, Oak Brook, IL 60521 • 312-986-2263

60 responses • 78% judged package and 76% judged vendor outstanding • 10% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



DATA ANALYZER • TSI International, 187 Danbury Road, Wilton, CT 06987 • 203-853-2884

53 responses • 57% judged package and 51% judged vendor outstanding • 26% actively seeking to replace package, with 6% citing unsatisfactory performance as reason.



Ratings Values

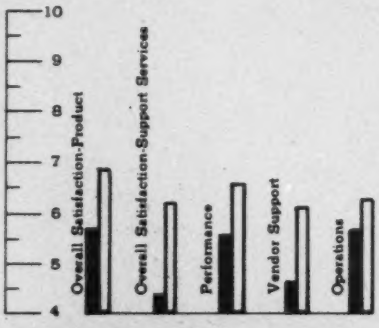
10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

Legend

Specific Product Rating
Group Average Rating

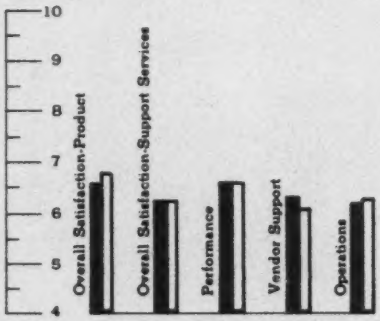
DATA CATALOGUE 2 • TSI International, 187 Danbury Road, Wilton, CT 06987 • 203-853-2884

40 responses • 47% judged package and 28% judged vendor outstanding • 20% actively seeking to replace package, with 10% citing unsatisfactory performance as reason.



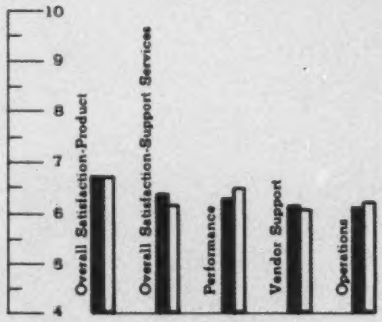
KEY/MASTER • TSI International, 187 Danbury Road, Wilton, CT 06987 • 203-853-2884

53 responses • 72% judged package and 66% judged vendor outstanding • 13% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



UCC TEN • University Computing Co., UCC Tower, Exchange Park, Dallas, TX 75235 • 214-353-7150

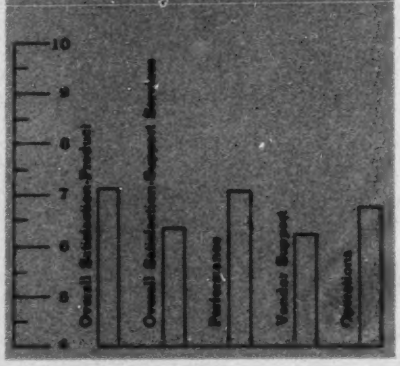
22 responses • 86% judged package and 64% judged vendor outstanding • 18% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



□ PROGRAM DEVELOPMENT AIDS/ PROGRAMMING UTILITIES

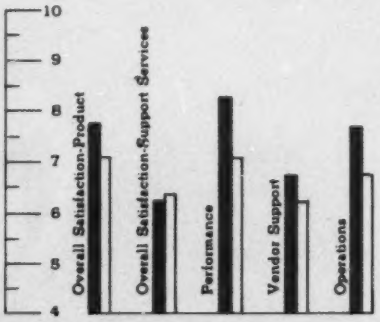
Group Average • 13 packages

118 responses • 78% judged package and 66% judged vendor outstanding • 10% actively seeking to replace package, with 1% citing unsatisfactory performance as reason.



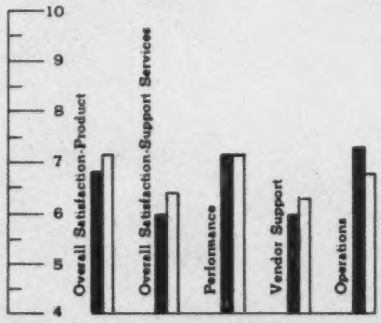
QUOTA II • Altergo Products, Inc., 400 W. Cummings Park, Suite 6900, Woburn, MA 01801 • 617-938-8811

24 responses • 97% judged package and 67% judged vendor outstanding • 17% actively seeking to replace package, with 4% citing unsatisfactory performance as reason.



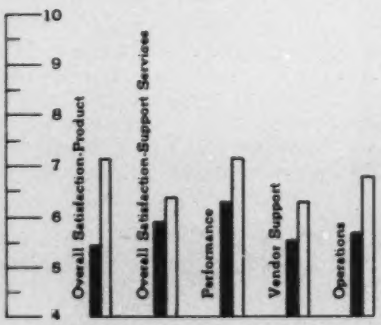
CPG • Altergo Products, Inc., 400 W. Cummings Park, Suite 6900, Woburn, MA 01801 • 617-938-8811

54 responses • 72% judged package and 52% judged vendor outstanding • 22% actively seeking to replace package, with 6% citing unsatisfactory performance as reason.



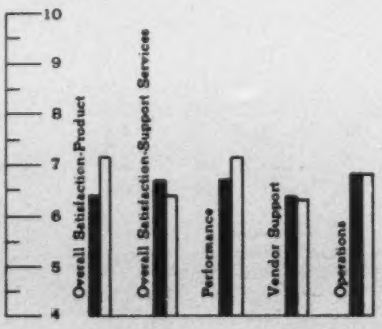
AUTOFLOW II • Applied Data Research, Rt. 206 & Orchard Road, CN 8, Princeton, NJ 08540 • 201-874-9100

22 responses • 36% judged package and 46% judged vendor outstanding • 5% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



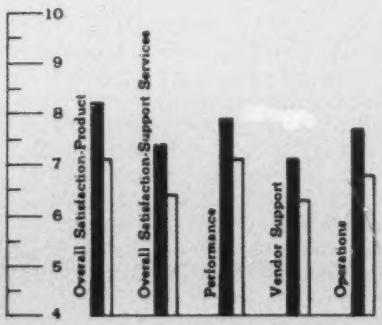
METACOBOL • Applied Data Research, Rt. 206 & Orchard Road, CN 8, Princeton, NJ 08540 • 201-874-9100

31 responses • 58% judged package and 68% judged vendor outstanding • 10% actively seeking to replace package, with 3% citing unsatisfactory performance as reason.



VOLLIE • Applied Data Research, Rt. 206 & Orchard Road, CN 8, Princeton, NJ 08540 • 201-874-1900

61 responses • 97% judged package and 89% judged vendor outstanding • 11% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



Ratings Values

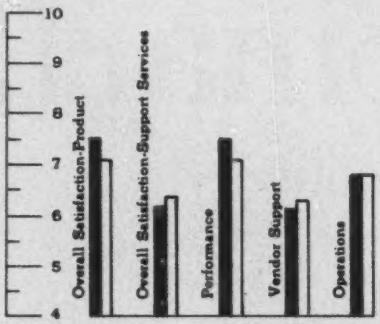
10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

Legend

Specific Product Rating
Group Average Rating

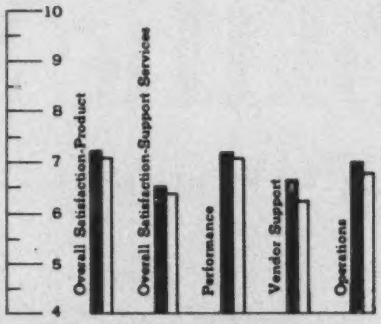
MANTIS • Cincom Systems, Inc., 2300 Montana Avenue, Cincinnati, OH 45211 • 513-662-2300

29 responses • 76% judged package and 66% judged vendor outstanding • 17% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



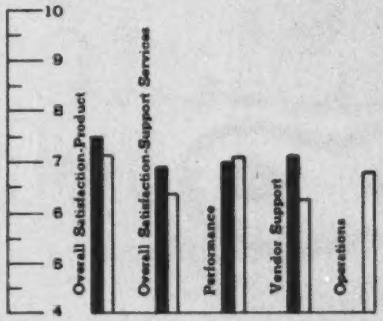
CA-OPTIMIZER • Computer Associates International, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6733

38 responses • 92% judged package and 76% judged vendor outstanding • 8% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



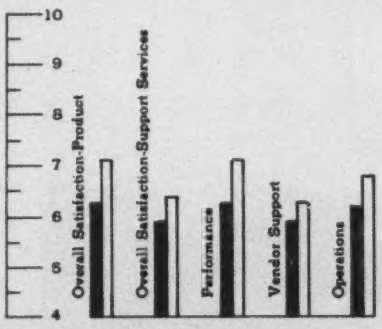
IMSL FORTRAN LIBRARIES • IMSL, Inc., Sixth Floor, NBC Building, 7500 Bellaire Boulevard, Houston, TX 77036 • 713-772-1927

44 responses • 89% judged package and 66% judged vendor outstanding • 2% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



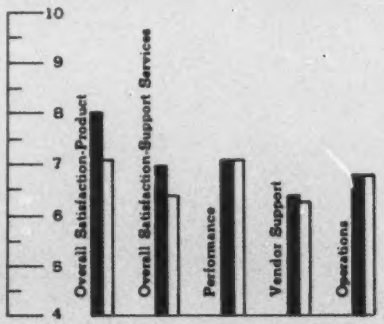
MARK IV • Informatics General Corp., 9441 LBJ Freeway, Dallas, TX 75243 • 214-231-1400

58 responses • 62% judged package and 56% judged vendor outstanding • 18% actively seeking to replace package, with 5% citing unsatisfactory performance as reason.



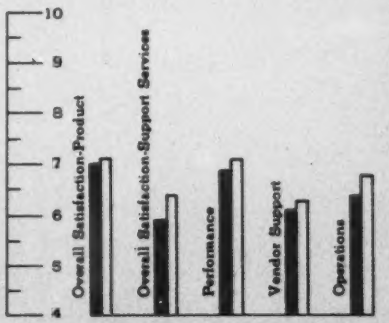
INTERTEST • On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, NJ 07024 • 201-592-0009

68 responses • 94% judged package and 83% judged vendor outstanding • 2% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



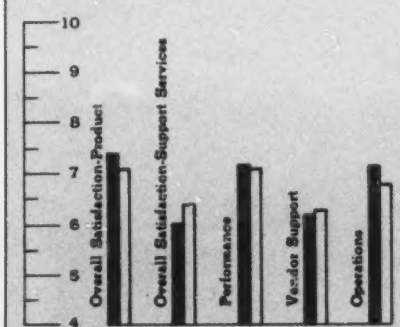
UFO • Oxford Software Corp., 174 Boulevard, Hasbrouck Heights, NJ 07604 • 201-288-1515

68 responses • 79% judged package and 57% judged vendor outstanding • 9% actively seeking to replace package, with 3% citing unsatisfactory performance as reason.



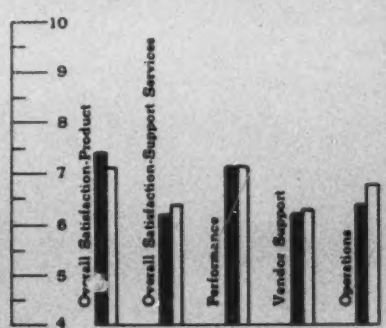
O-W-L • Pansophic Systems, Inc., 709 Enterprise Drive, Oak Brook, IL 60521 • 312-986-2263

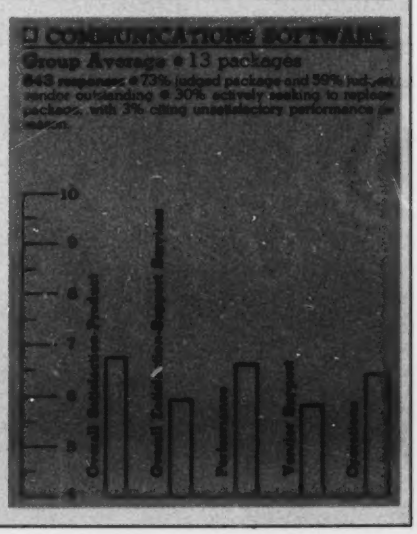
70 responses • 86% judged package and 61% judged vendor outstanding • 13% actively seeking to replace package, with 4% citing unsatisfactory performance as reason.



NATURAL • Software AG of North America, International Center, 11800 Sunrise Valley Drive, Suite 1517, Reston, VA 22091 • 703-860-5050

57 responses • 88% judged package and 65% judged vendor outstanding • 2% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.





Ratings Values

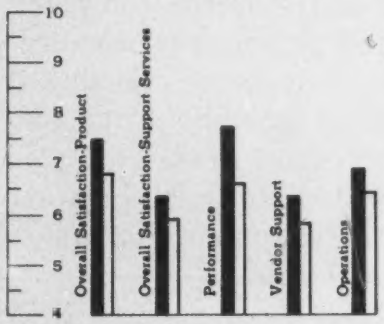
10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

Legend

Specific Product Rating
Group Average Rating

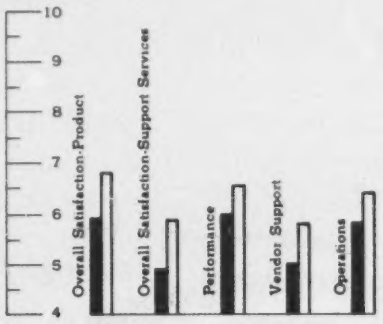
SHADOW II • Altergo Products, Inc., 400 W. Cummings Park, Suite 6900, Woburn, MA 01801 • 617-938-8811

52 responses • 83% judged package and 69% judged vendor outstanding • 44% actively seeking to replace package, with 6% citing unsatisfactory performance as reason.



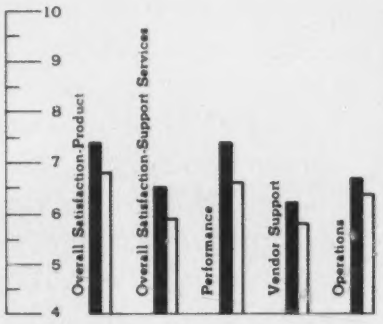
ADR/DATACOM/DC • Applied Data Research, Rt. 206 & Orchard Road, CN 8, Princeton, NJ 08540 • 201-874-9100

51 responses • 57% judged package and 37% judged vendor outstanding • 24% actively seeking to replace package, with 10% citing unsatisfactory performance as reason.



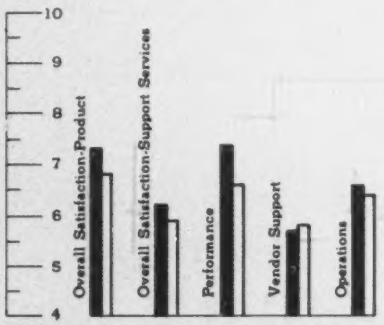
ADR/ROSCOE • Applied Data Research, Rt. 206 & Orchard Road, CN 8, Princeton, NJ 08540 • 201-874-9100

51 responses • 86% judged package and 71% judged vendor outstanding • 4% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



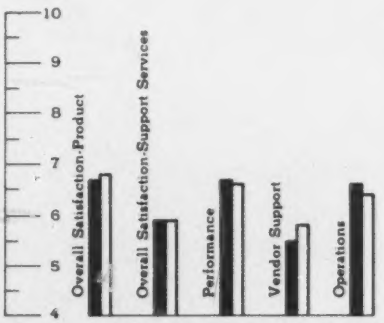
NDL • Burroughs Corporation, Burroughs Place, Detroit, MI 48232 • 313-972-9127

48 responses • 81% judged package and 69% judged vendor outstanding • 10% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



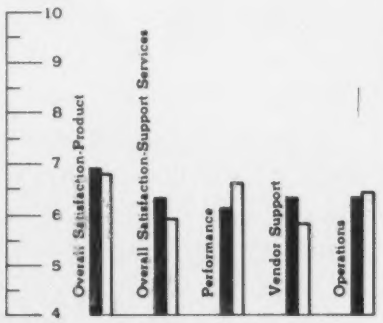
ENVIRON/1 • Cincom Systems, Inc., 2300 Montana Avenue, Cincinnati, OH 45211 • 513-662-2300

54 responses • 74% judged package and 54% judged vendor outstanding • 43% actively seeking to replace package, with 4% citing unsatisfactory performance as reason.



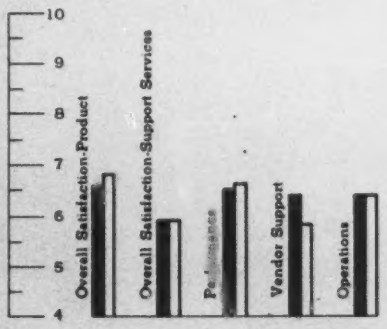
CICS/VS • IBM, National Accounts Division, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900

35 responses • 83% judged package and 68% judged vendor outstanding • 3% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



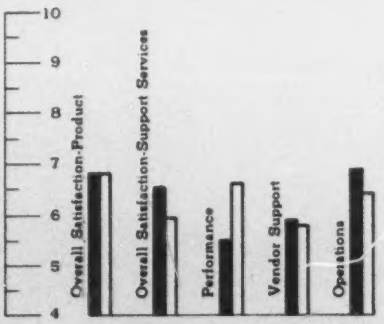
ICCF • IBM, National Accounts Division, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900

31 responses • 68% judged package and 52% judged vendor outstanding • 23% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



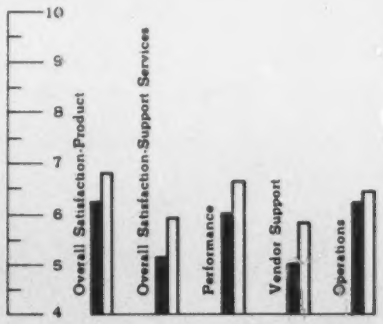
IMS/DC • IBM, National Accounts Division, 1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900

24 responses • 83% judged package and 79% judged vendor outstanding • 4% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



INTERCOMM • Polygon Systems, 71 Fifth Avenue New York, NY 10003 • 212-741-5200

31 responses • 65% judged package and 45% judged vendor outstanding • 71% actively seeking to replace package, with 13% citing unsatisfactory performance as reason.



Ratings Values

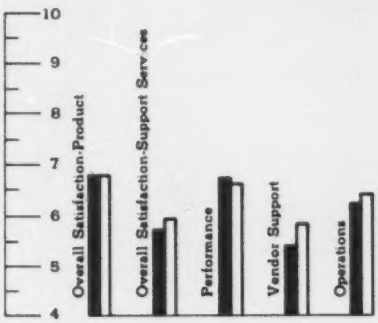
10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

Legend

Specific Product Rating
Group Average Rating

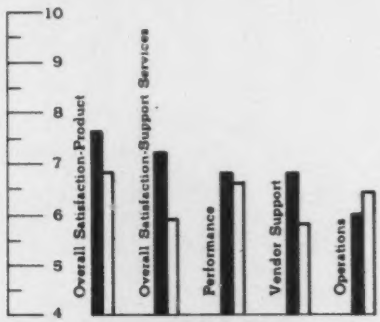
COM-PLETE • Software AG of North America, International Center, 11800 Sunrise Valley Drive, Suite 1517, Reston, VA 22091 • 703-860-5050

48 responses • 71% judged package and 54% judged vendor outstanding • 15% actively seeking to replace package, with 4% citing unsatisfactory performance as reason.



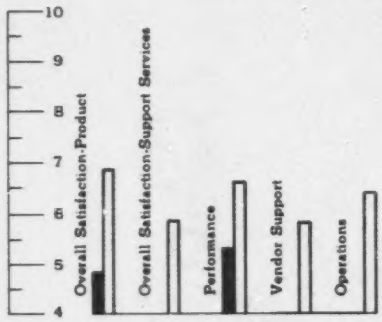
TONE 3 • Tone Software Corporation, 1735 S. Brookhurst, Anaheim, CA 92804 • 714-991-9460

19 responses • 84% judged package and 74% judged vendor outstanding • 37% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



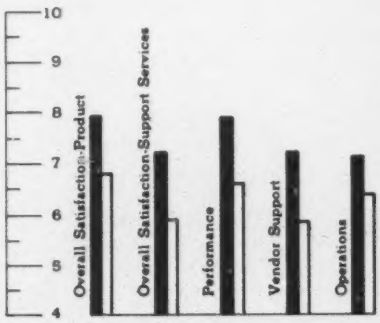
TASK/MASTER • TSI International, 187 Danbury Road, Wilton, CT 06987 • 203-853-2884

23 responses • 30% judged package and 13% judged vendor outstanding • 83% actively seeking to replace package, with 35% citing unsatisfactory performance as reason.



WESTI • Westinghouse Electric Corp., 2040 Ardmore Boulevard, Pittsburgh, PA 15221 • 412-636-3100

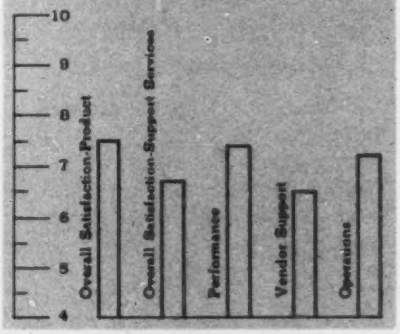
76 responses • 88% judged package and 83% judged vendor outstanding • 26% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



☐ UTILITIES/OPERATING SYSTEMS/ENHANCEMENTS

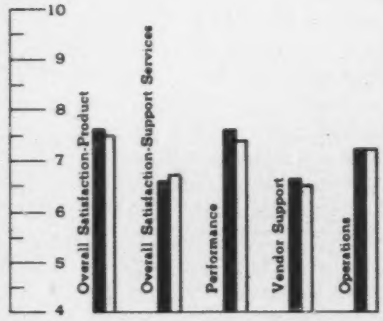
Group Average • 34 packages

1,813 responses • 86% judged package and 71% judged vendor outstanding • 10% actively seeking to replace package, with 1% citing unsatisfactory performance as reason.



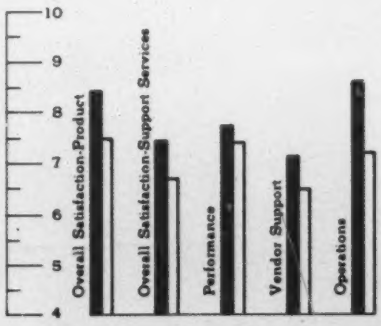
THE LIBRARIAN • Applied Data Research, Rt. 206 & Orchard Road, CN 8, Princeton, NJ 08540 • 201-874-9100

49 responses • 94% judged package and 78% judged vendor outstanding • 0% actively seeking to replace package.



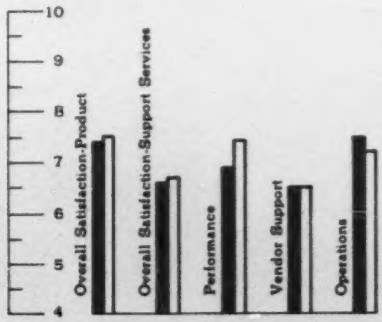
ACF2 • The Cambridge Systems Group, 24275 Elise Court, Los Altos Hills, CA 94022 • 415-941-4558

72 responses • 96% judged package and 81% judged vendor outstanding • 4% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



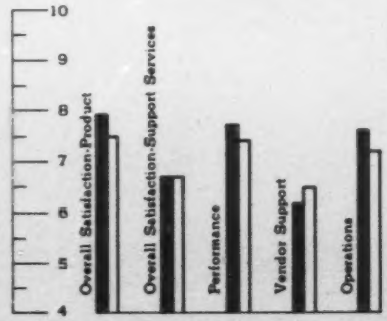
ASM2 • The Cambridge Systems Group, 24275 Elise Court, Los Altos Hills, CA 94022 • 415-941-4558

64 responses • 89% judged package and 70% judged vendor outstanding • 11% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



SUPER-MSI • OGA Software Products Group, 1370 Piccard Drive, Rockville, MD 20850 • 301-948-9600

48 responses • 92% judged package and 73% judged vendor outstanding • 8% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



Ratings Values

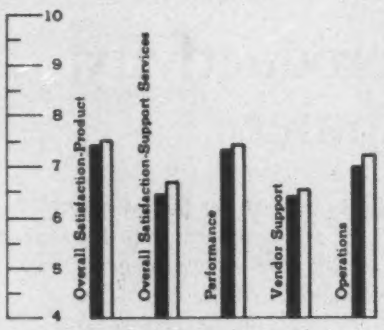
10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

Legend

Specific Product Rating
Group Average Rating

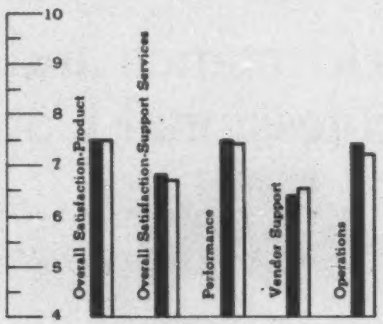
CA-DYNAM/D • Computer Associates International, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6733

56 responses • 91% judged package and 73% judged vendor outstanding • 7% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



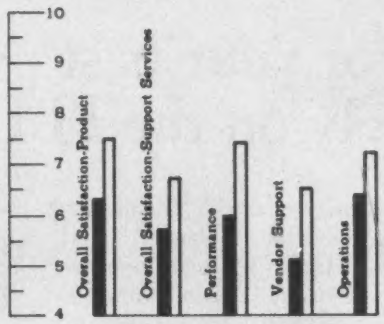
CA-DYNAM/T • Computer Associates International, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6733

65 responses • 85% judged package and 71% judged vendor outstanding • 8% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



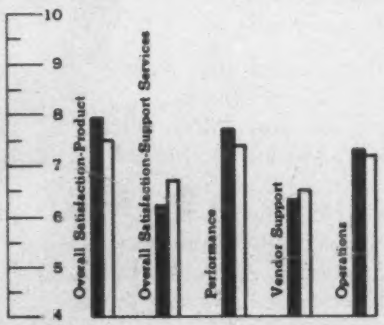
CA-JASPER • Computer Associates International, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6733

48 responses • 58% judged package and 56% judged vendor outstanding • 4% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



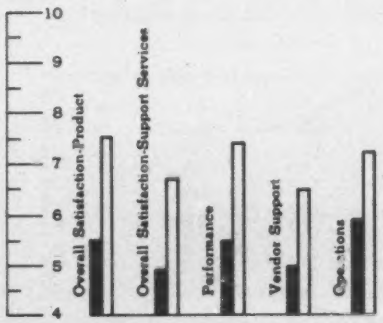
CA-RAPS • Computer Associates International, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6733

58 responses • 93% judged package and 69% judged vendor outstanding • 10% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



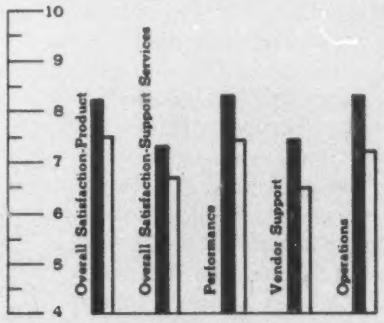
CA-SCHEDULER • Computer Associates International, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6733

29 responses • 52% judged package and 35% judged vendor outstanding • 10% actively seeking to replace package, with 7% citing unsatisfactory performance as reason.



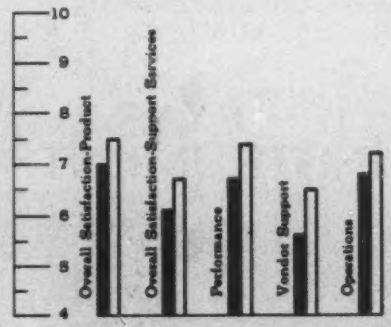
CA-SORT • Computer Associates International, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6733

65 responses • 94% judged package and 85% judged vendor outstanding • 6% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



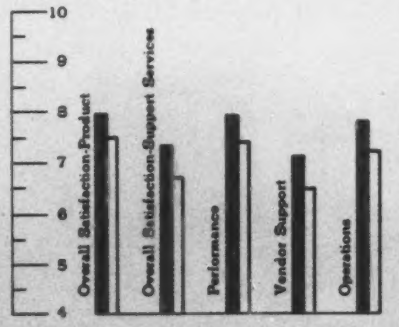
CA-TLMS • Computer Associates International, Inc., 125 Jericho Turnpike, Jericho, NY 11753 • 516-333-6733

44 responses • 75% judged package and 54% judged vendor outstanding • 14% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



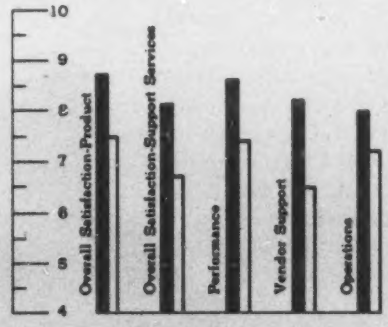
ABEND-AID • Compuware, 32100 Telegraph Road, Birmingham, MI 48010 • 313-540-0900

58 responses • 93% judged package and 76% judged vendor outstanding • 0% actively seeking to replace package.



SYSTEM/MANAGER • Corodale, Inc., 211 Congress Street, Boston, MA 02110 • 617-426-8780

69 responses • 100% judged package and 96% judged vendor outstanding • 10% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



Ratings Values

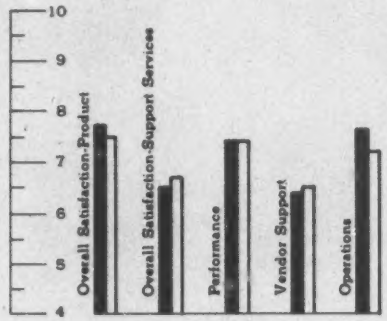
10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

Legend

Specific Product Rating
Group Average Rating

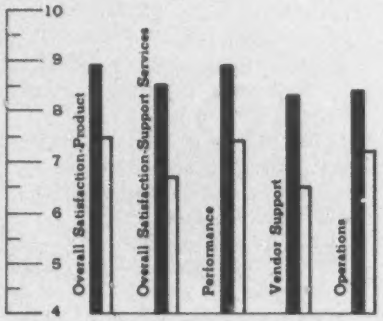
SHRINK • Informatics General Corp., 9441 LBJ Freeway, Dallas, TX 75243 • 214-231-1400

42 responses • 93% judged package and 69% judged vendor outstanding • 5% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



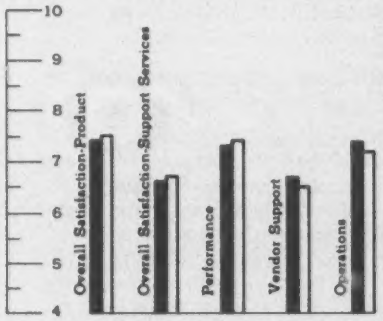
FAST/DUMP/RESTORE (FDR) • Innovation Data Processing, Inc., 970 Clifton Avenue, Clifton, NJ 07013 • 201-777-1940

74 responses • 99% judged package and 96% judged vendor outstanding • 1% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



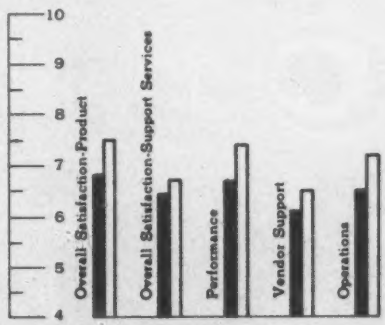
OS/DOS JOB ACCOUNTING SYSTEMS (JARS) • Johnson Systems, Inc., 8300 Greensboro Drive, Suite 700, McLean, VA 22102 • 703-821-1700

65 responses • 86% judged package and 69% judged vendor outstanding • 6% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



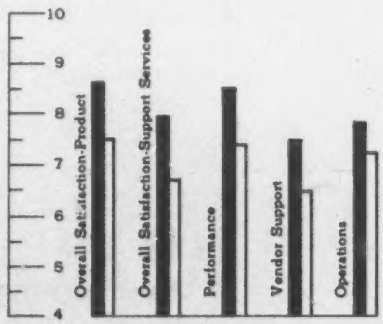
UMAX • Johnson Systems, Inc., 8300 Greensboro Drive, Suite 700, McLean, VA 22102 • 703-821-1700

47 responses • 81% judged package and 68% judged vendor outstanding • 6% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



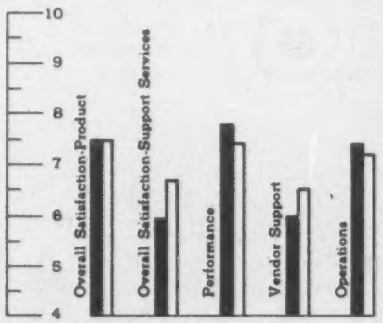
LOGOUT/MULTILOG • Macro 4, Inc., 1 West Hanover Avenue, Mt. Freedom, NJ 07970 • 201-895-4800

75 responses • 99% judged package and 91% judged vendor outstanding • 7% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



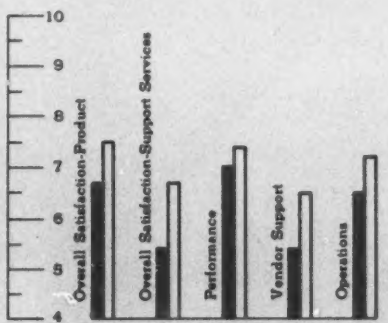
MICOS • Mini-Computer Systems, 399 Fairview Park Drive, Elmsford, NY 10523 • 914-592-8812

28 responses • 82% judged package and 61% judged vendor outstanding • 21% actively seeking to replace package, with 7% citing unsatisfactory performance as reason.



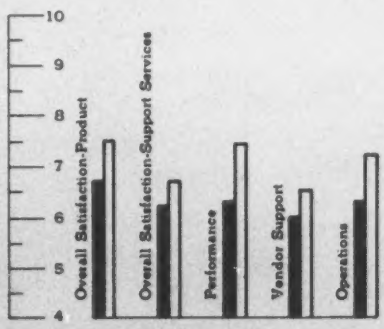
EDOS • Nixdorf Computer, 300 Third Avenue, Waltham, MA 02154 • 617-890-3600

27 responses • 74% judged package and 41% judged vendor outstanding • 37% actively seeking to replace package, with 7% citing unsatisfactory performance as reason.



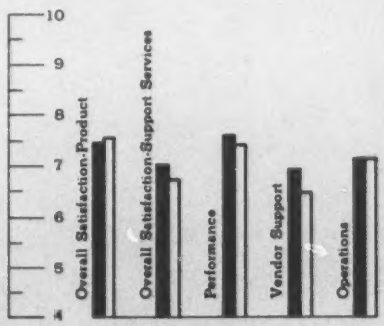
KOMAND • Pace Applied Technology, 7900 Sudley Road, Suite 602, Manassas, VA 22110 • 703-369-3200

45 responses • 76% judged package and 62% judged vendor outstanding • 11% actively seeking to replace package, with 4% citing unsatisfactory performance as reason.



PANVALET • Pansophic Systems, Inc., 709 Enterprise Drive, Oak Brook, IL 60521 • 312-986-2263

41 responses • 90% judged package and 76% judged vendor outstanding • 2% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



Ratings Values

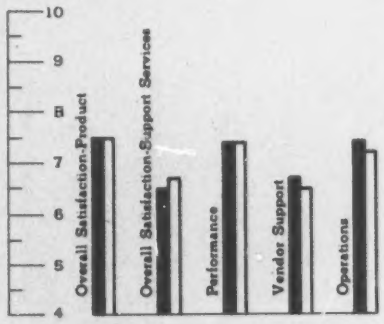
10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

Legend

Specific Product Rating
Group Average Rating

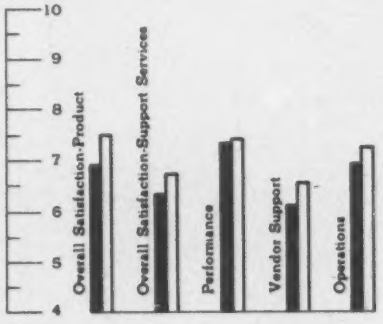
EPAT • SDI, Inc., 1700 South El Camino Real, P.O. Box 5801, San Mateo, CA 94402 • 415-572-1200

41 responses • 88% judged package and 66% judged vendor outstanding • 32% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



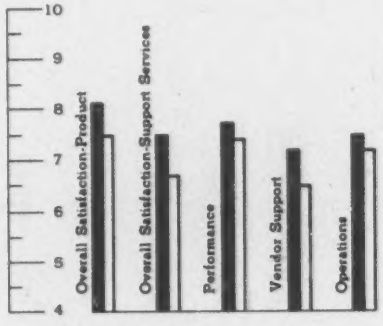
GRASP • SDI, Inc., 1700 South El Camino Real, P.O. Box 5801, San Mateo, CA 94402 • 415-572-1200

23 responses • 83% judged package and 57% judged vendor outstanding • 52% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



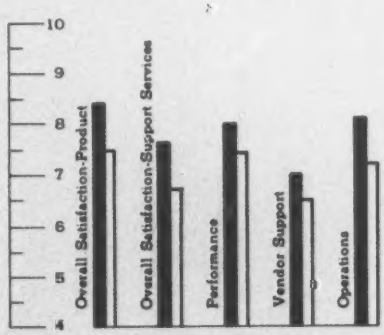
DMS/OS • Software Module Marketing, Crocker Bank Building, Penthouse, 1007 Seventh Street, Sacramento, CA 95814 • 916-441-7234

61 responses • 92% judged package and 89% judged vendor outstanding • 5% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



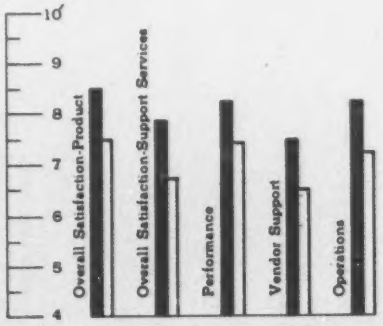
DOS/MVT/VSE • Software Pursuits, Inc., 444 Market Street, Suite 800, San Francisco, CA 94111 • 415-392-7171

65 responses • 95% judged package and 81% judged vendor outstanding • 14% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



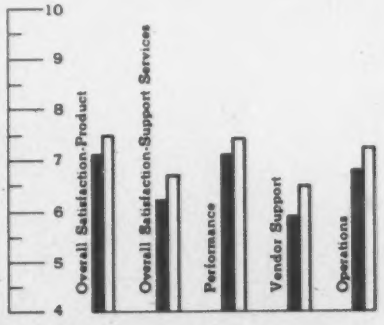
SYNCSORT • Syncsort, Inc., 560 Sylvan Avenue, Englewood Cliffs, NJ 07632 • 201-568-9700

60 responses • 97% judged package and 88% judged vendor outstanding • 2% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



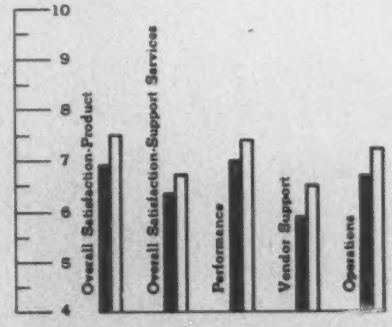
D/FAST • Tower Systems, 19782 MacArthur Blvd., Suite 365, Irvine, CA 92718 • 714-752-8263

64 responses • 78% judged package and 59% judged vendor outstanding • 17% actively seeking to replace package, with 3% citing unsatisfactory performance as reason.



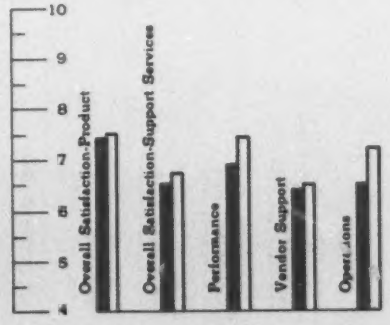
T/FAST • Tower Systems, 19782 MacArthur Blvd., Suite 365, Irvine, CA 92718 • 714-752-8263

66 responses • 79% judged package and 67% judged vendor outstanding • 11% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



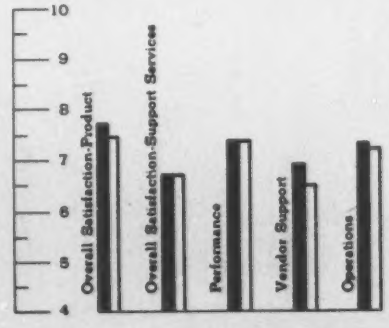
UCC ELEVEN • University Computing Co., UCC Tower, Exchange Park, Dallas, TX 75235 • 214-353-7150

45 responses • 87% judged package and 67% judged vendor outstanding • 4% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



UCC ONE • University Computing Co., UCC Tower, Exchange Park, Dallas, TX 75235 • 214-353-7150

58 responses • 93% judged package and 79% judged vendor outstanding • 2% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



Ratings Values

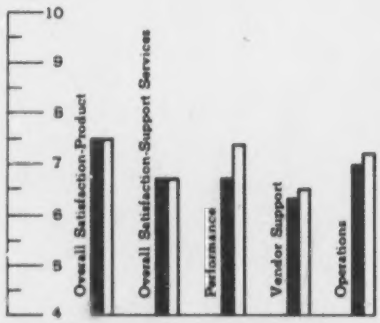
10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

Legend

Specific Product Rating
Group Average Rating

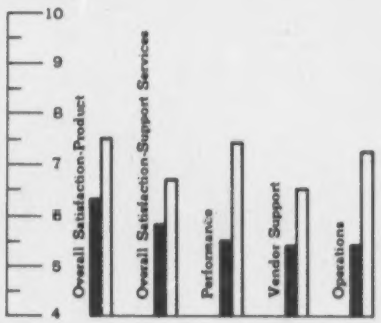
UCC SEVEN • University Computing Co., UCC Tower, Exchange Park, Dallas, TX 75235 • 214-353-7150

58 responses • 88% judged package and 67% judged vendor outstanding • 3% actively seeking to replace package, with 3% citing unsatisfactory performance as reason.



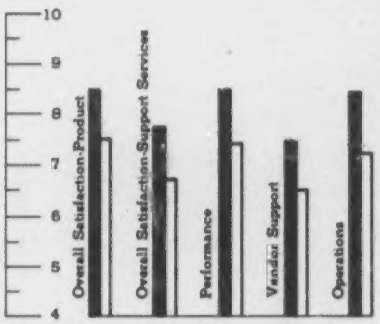
UCC TWO • University Computing Co., UCC Tower, Exchange Park, Dallas, TX 75235 • 214-353-7150

34 responses • 59% judged package and 56% judged vendor outstanding • 21% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



DISK UTILITIES • Westinghouse Electric Corp., 2040 Ardmore Boulevard, Pittsburgh, PA 15221 • 412-636-3100

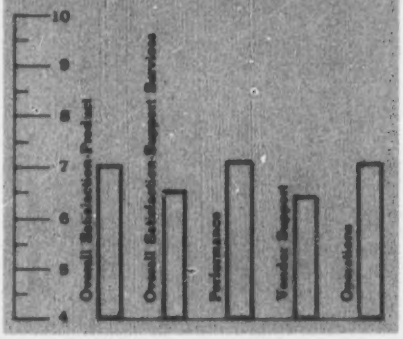
72 responses • 99% judged package and 88% judged vendor outstanding • 3% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



☐ MONITORING & PERFORMANCE AIDS

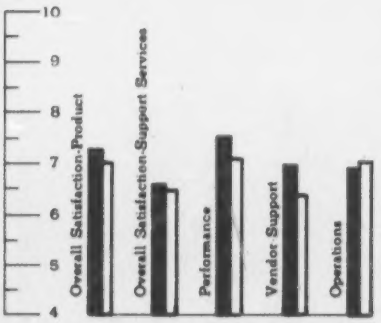
Group Average • 10 packages

433 responses • 79% judged package and 71% judged vendor outstanding • 12% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



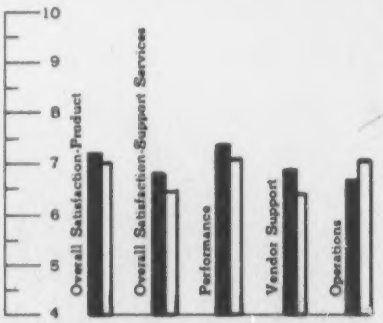
LOOK • Applied Data Research, Rt. 206 & Orchard Road, CN 8, Princeton, NJ 08540 • 201-874-9100

80 responses • 86% judged package and 72% judged vendor outstanding • 10% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



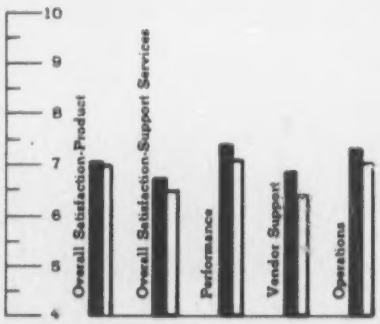
BEST/1 • BGS Systems, One University Office Park, 29 Sawyer Road, Waltham, MA 02254 • 617-891-000

54 responses • 87% judged package and 83% judged vendor outstanding • 11% actively seeking to replace package, with 2% citing unsatisfactory performance as reason.



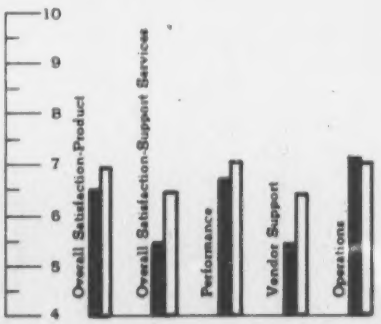
CAPTURE/MVS • BGS Systems, One University Office Park, 29 Sawyer Road, Waltham, MA 02254 • 617-891-0000

52 responses • 79% judged package and 83% judged vendor outstanding • 12% actively seeking to replace package, with 4% citing unsatisfactory performance as reason.



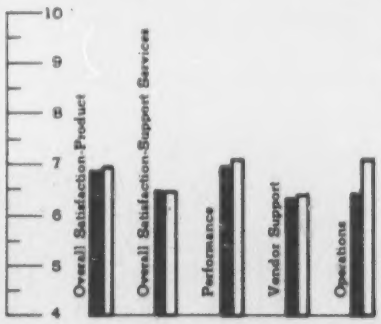
CMF/MONITOR • Boole & Babbage, Inc., 510 Oakmead Parkway, Sunnyvale, CA 94086 • 408-735-9550

53 responses • 73% judged package and 59% judged vendor outstanding • 21% actively seeking to replace package, with 6% citing unsatisfactory performance as reason.



CONTROL/IMS & CONTROL/REAL-TIME • Boole & Babbage, Inc., 510 Oakmead Parkway, Sunnyvale, CA 94086 • 408-735-9550

49 responses • 80% judged package and 69% judged vendor outstanding • 12% actively seeking to replace package, with 4% citing unsatisfactory performance as reason.



Ratings Values

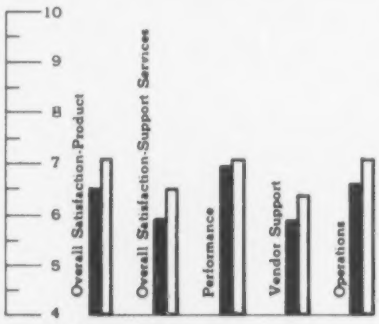
10-9: Superior
8-6: Very Good
5-3: Acceptable
2-1: Inadequate

Legend

Specific Product Rating
Group Average Rating

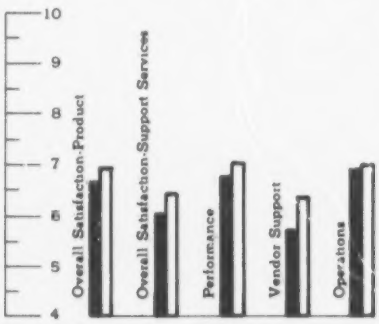
RESOLVE-RESOLVE/CICS • Boole & Babbage, Inc., 510 Oakmead Parkway, Sunnyvale, CA 94086 • 408-735-9550

39 responses • 74% judged package and 61% judged vendor outstanding • 10% actively seeking to replace package, with 3% citing unsatisfactory performance as reason.



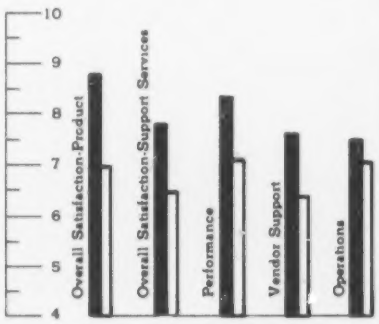
TSA/PPE • Boole & Babbage, Inc., 510 Oakmead Parkway, Sunnyvale, CA 94086 • 408-735-9550

38 responses • 71% judged package and 63% judged vendor outstanding • 5% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



OMEGAMON • Candle Corporation, 10880 Wilshire Blvd., Suite 2404, Los Angeles, CA 90024 • 213-470-2277

32 responses • 97% judged package and 81% judged vendor outstanding • 0% actively seeking to replace package.

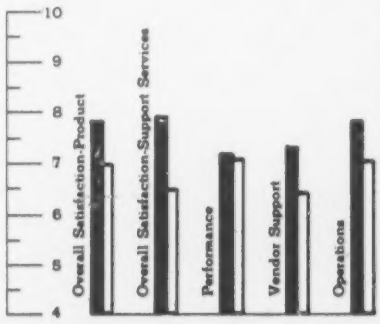


REPORT AVAILABLE

This systems software survey is based on a forthcoming report in Data Decisions' *Software*, a monthly information service covering systems and applications software. Additional information on Data Decisions' subscription services and custom consulting capabilities is available from Data Decisions, 20 Brace Rd., Cherry Hill, NJ 08034, (609) 429-7100.

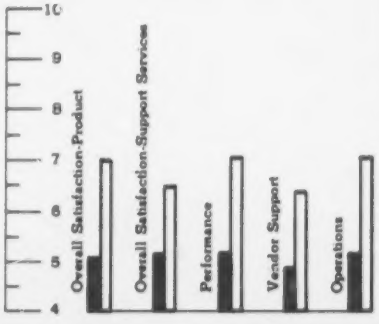
TSO/MON • Morino Associates, 8133 Leesburg Pike, Suite 602, Vienna, VA 22180 • 703-734-9494

40 responses • 85% judged package and 95% judged vendor outstanding • 8% actively seeking to replace package, with 0% citing unsatisfactory performance as reason.



COMPUT-A-CHARGE • Value Computing, Inc., 498 North Kings Highway, Cherry Hill, NJ 08034 • 609-482-2500

26 responses • 54% judged package and 46% judged vendor outstanding • 31% actively seeking to replace package, with 15% citing unsatisfactory performance as reason.



UNIVERSITY OF PETROLEUM & MINERALS
DHAHRAN, SAUDI ARABIA
COMPUTER SCIENCE AND ENGINEERING DEPARTMENT

The Department of Computer Science and Engineering will have faculty positions in Computer Science and Engineering open for the Academic Year 1984-85, starting 1 September 1984.

ACADEMIC QUALIFICATIONS AND EXPERIENCE:

Ph.D. in Computer Science or Computer Engineering or in a closely related discipline with emphasis in programming languages, Data Base-Organization and Structure, Microprocessors, Operating Systems, Data Processing, System Analysis, Digital Design, Computer Architecture, Software Engineering, Micro-Electronics and Robotics.

The Department offers an undergraduate program in Computer Science and Engineering and a Master program in Computer Sciences.

Computing facilities available include a Computer-Aided-Instruction Center based on an HP-3000 and a number of Micro-Computers, a Computer-Graphics Center with a VAX 11/780 and number of work stations in addition to an IBM 360/158, IBM 3033 and various minicomputers and microcomputers.

English is the language of instruction.

Minimum regular contract for two years, renewable. Competitive salaries and allowances. Air conditioned and furnished housing provided. Free air transportation to and from Dhahran each year. Attractive Educational Assistance Grants for school age dependent children. All earned income without Saudi taxes. Ten months duty each year with two months vacation with salary. There is also possibility of selection for the University's on-going Summer Program with good additional compensation.

Apply before 30 January 1984, with complete resume on academic, professional and personal data, list of references, publications and research details, and with copies of transcripts and degrees, including home and office addresses and telephone numbers:

University of Petroleum & Minerals
Houston Office (Dept. 105)
5718 Westheimer, Suite 1550
Houston, TX 77057

CIRCLE 77 ON READER CARD

For systems people, there is no clear path to the Land of Oz. Most dpers have to create their own Yellow Brick Roads.

DP CAREER PATHS

by Kate M. Kaiser

According to many dp people, the phrase "career paths of systems professionals" is an oxymoron: a figure of speech combining contradictory ideas, like jumbo shrimp, football scholarship, and business ethics. Why? Because people who work as senior systems analysts or as project leaders have few possibilities for hierarchical advancement, and any available paths are often blocked. Many firms have no formalized structure in the MIS department, partly because the field is still relatively new. Because evaluating technical expertise is difficult, the human resource function in most firms must turn the usual recruiting, screening, and developing roles over to the MIS director. Since many MIS directors come from such a technical orientation, their management style might be more "seat of the pants" than that of some of their counterparts in marketing or finance.

The career path model used by most firms is a variation of entry level programmer to analyst to project leader to manager. Sometimes, the adjectives junior and senior are used, along with combinations of the above three titles, linked by slashes. A typical organization design is shown in Fig. 3. A more progressive approach is displayed by firms that separate the technical and application functions in parallel tracks with equivalent stature. The bind for most individuals is that they attain the level of senior systems analyst in four to 10 years, often because of turnover and demand rather than ability. Individuals who want a continuing challenge see few formal routes that provide motivation. The MIS director is faced with a similar dilemma, since it is almost impossible to move from MIS to top management. As firms recognize the information resource's value, this may change, but it certainly hasn't happened yet. Conversations with dp personnel about career paths are flavored with the words dead end, stopped up, and isolated.

Long-term data concerning systems staff are scant except for government statistics collected by the Bureau of the Census and the Department of Labor (DOL). These data do not track individuals except by chance on the DOL annual sample of job mobility, which started in 1981.

Beginning in 1979, the author collected data over a four-year period on the jobs of systems and user staff who were involved in major development projects in large private firms. Of the 108 participants in 1979, 65 people reported to a systems department and 43 to a user area. Users were included for three reasons: to compare employment differences, to collect user perceptions of systems career paths, and to see if users crossed over to systems. Twenty participants who were users when the survey was begun and who intended to remain users until 1988 were not included for further study. By 1983, two of the original 108 were deceased, four had retired, 15 had no known whereabouts, seven were contacted but did not respond, and one had left the work force to raise a family, making a total of 59 respondents. Between 1982 and 1983, professionals from 35 firms were contacted by telephone and given the choice of a personal interview by phone or a mail questionnaire with phone follow-up. Ten chose the questionnaire. The interview was held within 10 days of contact. Updates on the early interviews were obtained in 1983. The questions focused on updating the respondent's employment history over the past four years and on his or her professional aspirations for 1988.

The survey offers information on 36 firms (20 in manufacturing, nine in the financial area, three service firms, and four utilities). All of the firms are among the Fortune 500 or the top 50 within their fields. Many are located in the Midwest, where the recession has had an obvious impact. It was assumed that these large firms would offer more sophisticated career possibilities to MIS staff because of their potential resource level, compared to that of smaller firms. In 1979, the number of firms that respondents worked at was 27; in 1983, the number rose to 35 after eight people left their original employers. Only two participants had been with three firms during that four-year period. None of the companies are in the dp area.

Demographic data about the final 59 participants are contained in Fig. 2. In drawing a composite of the nine women and 50 men, we see a mature dp professional who spent a significant amount of time with a firm after working for one or two other organizations. There are exceptions among the real-life respondents, however: two individuals who are very close to retirement spent their entire work lives with one firm. Four of the highest salary figures belong to users now in top management positions. These users were included because they were part of a development team in 1979, and two have MIS reporting to them now or will in their next positions. Two of the other respondents are in the top MIS in their divisions and have been there since 1979. The salary levels of the other 53 respondents suggest that they hold senior systems analyst or middle management data processing positions. Such high-level positions may be a result of their tenure in dp. Twenty of the respondents spent their entire work lives in data processing, with an average of 16.75 years. The grandfather of this group (by virtue of his seniority and his two grandchildren) started on tab equipment.

Included in the survey are some of the early systems professionals. The observations of such a vanguard group are valuable, because these trailblazers are now managing and working with younger systems professionals who have had the opportunity to get formal MIS training. Degrees in computer science did not become available until the early '70s, and MIS degree programs were devised even later.

STUDY GROUP IS STABLE

As for turnover, our study group is a surprisingly stable set. Fifteen have stayed with their original firms for an average of 19 years. Most have been with their firms 12 years. This evidence supports popular notions that turnover is related to age. One user who worked at five firms is due to retire in five years and has been with his present company for 15 years. The systems person who was with eight firms has been with his current employer 18 years. In general, these people have been at their present organizations for two thirds of their work lives, a fact that explains why 64% of

ILLUSTRATION BY BERNARD BONHOMME

them responded that they are organization loyal.

In 1983, 25% report to a user department and 75% report to a systems area. These percentages may not be precise, because some user departments have a resident systems analyst. Also, some true users intend to stay in systems only long enough to acquire technical skills and then return to their functional areas. Nine such "users" were included as a control group.

Eighty percent of the respondents are in supervisory roles and can be grouped as generic senior systems analysts/project leaders because of their functions. Three systems professionals are closer to programmer/analysts. One of these three who worked full-time in 1979 went part-time four years ago following maternity leave.

Formal training is varied. Because of the maturity of the sample there are only six who have bachelor's degrees in computer science. Since so few had the opportunity to pursue a degree in their field, why did they consider a dp career? Most couldn't have said, "I want to grow up to be a systems analyst," because the field didn't exist when they were first considering their career goals. Some sought formal training, some experienced on-the-job motivation, and some had "deliberate accidents."

Ed was in the Merchant Marine, his wife was pregnant, and he saw an ad for a computer course in the paper. Mickey was an artist and found himself drafted. The army did not value his artistic skills, so he took a dp training course. Mickey comments that his artwork is very precise, and he feels he uses his creativity in systems design. Others mentioned taking computer course electives, which inspired them to go into the field. Mark and Rob were steered by employment agencies. Jack credited an IBM sales rep as his lead.

On-the-job motivation means being in a situation that evoked the respondents' interest or curiosity. For instance, Bill was a user who got tired of hearing the systems staff use dp jargon and then say, "We can't do it." He thought they did not listen and was frustrated with explaining what he felt to be merely common sense. Dp relaxed its recruiting rules and he became systems staff. Several people mentioned they had been in a scientific environment, were handed a manual, and told in essence to "go make this work on a computer." One CPA was trained in edp auditing while working for a Big Eight accounting firm. A couple of Navy veterans received exposure through their assignments. Eighteen years ago a job in process control forced Gene to learn about computers. He didn't like it at first but was soon hooked.

The "deliberate accidents" are more

FIG. 1

PAST, PRESENT, AND FUTURE TITLES

1979 TITLE	NO. OF TITLE CHANGES 1979–1983	1983 TITLE	1988 ASPIRATION
Junior SA	4	EDP Auditor	Project Leader
P/A	1	Senior P/A	Senior SA Advisor
Mgr. Tech. Systems	3	MIS Director	VP Info. Systems
Manager Sys. Devel.	1	Director	VP Administrator
Manager Dp	0	No Change	Manager Dp
SA	2	Materials Manager	General Manager
Systems Consultant	1	Mgr. Sys. & Methods	VP MIS
Sys. & Methods Admin.	1	Systems Consultant	Not yet defined
Project Manager	0	No Change	VP Area Manager
Area Manager	0	No Change	Dept. Manager
Asst. VP Community Banking Coord.	1	VP Community Banking Coord.	More "consulting"
Systems Consultant	2	VP Manager Telecom	Corporate Telecom Manager
P/A III	2	Advisor Computer Systems	Same until retirement (after '88)
Mgr. Mgmt. Systems	1	Mgr. Prime Services	Director MIS
Accounting Analyst	0	No Change	Accounting Manager
P/A	2	Part-time P/A	Tech. Consultant
Senior SA	4	*Supervisor Tax Sys.	Partner
Systems Manager	0	No Change	Systems Science Manager
SA	1	MIS Specialist	Manager Operations
MIS Specialist	2	*DB Administrator	Director MIS
Project Manager	0	No Change	Director
P/A	4	Coord. Info. Center	Division Manager
Sr. Methods Analyst	4	*Senior SA	Coordinator
Project Leader	2	*Contract Programmer	Program & Sys. Design
P/A	1	Computer Performance Analyst	No goal
P/A	4	**Senior SA/Prog.	Senior SW Programmer
SA/Programmer	1	SA	Senior SA
Supervisor Plant Eng.	2	Sr. Supervisor Sys. Operations	Divisional Buyer Purchasing
Programmer	3	Supervisor IS (I)	Supervisor IS (II)
Methods & SA	0	No Change	Medical school
SA	0	No Change	Teaching
Sys. Dev. Specialist	1	Sys. Dev. Supervisor	Systems Manager
Project Manager	1	2nd VP & Sys. Officer	Sys. Dept. Manager
Staff Assistant	0	No Change	Computer Sys. Div. Manager
Project Manager	1	No Change	Break Unit Head Dp
Systems Officer	5	Senior Sys. Planner	Operations Manager
Consolidation Acct.	5	Project Leader	Consultant
Applications Analyst	8	**Assoc. Dir. Medical Products	Consultant
Software Analyst	4	Section Manager	Director MIS
Op. Consultant	3	VP Marketing	VP Production Planning & Strategic Planning
SA	1	Sr. Proj. Manager	Sr. Tech. Project Mgr.
Project Manager	3	Assoc. Dir. IS Policies & Planning	MIS Director
Project Manager	2	Senior SA	Super. Integrated IS (II)
Mgr. MIS	0	No Change	Director IRM
Sr. Sys. Consultant	2	*Asst. to VP Planning & Admin.	Planning

*—One firm change
**—Two firm changes
P/A—Programmer Analyst
SA—Systems Analyst
Roman Numerals I, II, or III—Levels I, II, or III

Note: This list excludes retirees, dropouts, and users who plan to remain users.

amusing. In 1956, on a research lab tour, one college student was offered a job plotting trajectories from printouts. Dan went to an agency and said he wanted "something different," and he got it. Connie tagged along with a friend who was taking the civil service exam in programming. As an 18-year-old, Don carried tests back and forth to departments for a year. He was fortunate that his boss was the manager of software and sent him on for training to be an associate programmer.

A few of the users who were assigned as project liaisons found systems intriguing because of a dp project they worked on in 1979, and decided to learn more. One former accountant is completing his master's in computer science and is now a systems analyst.

JOB TITLE DATA VALUABLE

In regard to job descriptions, dp is similar to other areas in that the job title may not reflect the actual functions of the position. For the purposes of this study, however, job title information is valuable, because a change in title often reflects a promotion. The title also indicates whether the individual is in a supervisory role. This sample includes few novices; therefore, by 1983, 80% are in management roles via promotions, according to the data (see Fig. 1). In five cases a change was made from systems to a user area, and in two cases the reverse was true. Lateral moves within a systems area to develop more technical skills involved three people. A change in title does not indicate a change in compensation.

Some titles appear to be in a systems area, but the person may actually report to a user area. One individual moved from one bank to another over the four-year period, but his title did not change. In one organization a new MIS director came in and relabeled all systems staff as programmer/analysts. This title change upset two systems people, because they felt it was a demotion even though their salaries remained the same. A year later one of these two was assigned a supervisory position and a new title within the same organization. Fourteen who are still with their 1979 firms have the same job titles. During the interviews, it was evident that three of those people were unhappy. One who had been with his firm for nine years originally said he would stay put until his boss moved. An update six months later revealed that he had been released and was doing contract work. The other two are leaving the business environment altogether. They both discussed cutbacks and boredom with maintenance activity. One of these two hadn't received a raise in two and a half years. Because of a maternity leave during 1980, Rhonda works part-time now in the same 1979 job title. Her responsibilities moved up two levels, but her title remains the same because of cutbacks and her part-time status.

The average number of job changes is 1.7, with one woman having eight different titles. She considers her career unusual for the business and dp worlds and for women, and attributes these promotions to the unparalleled growth of MIS in her firm and her luck in timing. Her last move was out of the firm she had been with for six years, because she wanted to learn about a variety of industries as a consultant and because of "an irreconcilable style difference with new management." Seven users and 16 systems people changed firms (three had done so twice), making the average yearly turnover rates 5.6% and 6.9%, respectively. Although some mentioned the recession, very few indicated that their canvassing extended beyond the Sunday paper. Several had had interviews since 1979, and serious considerations about changing jobs involved family and job challenge, but not money.

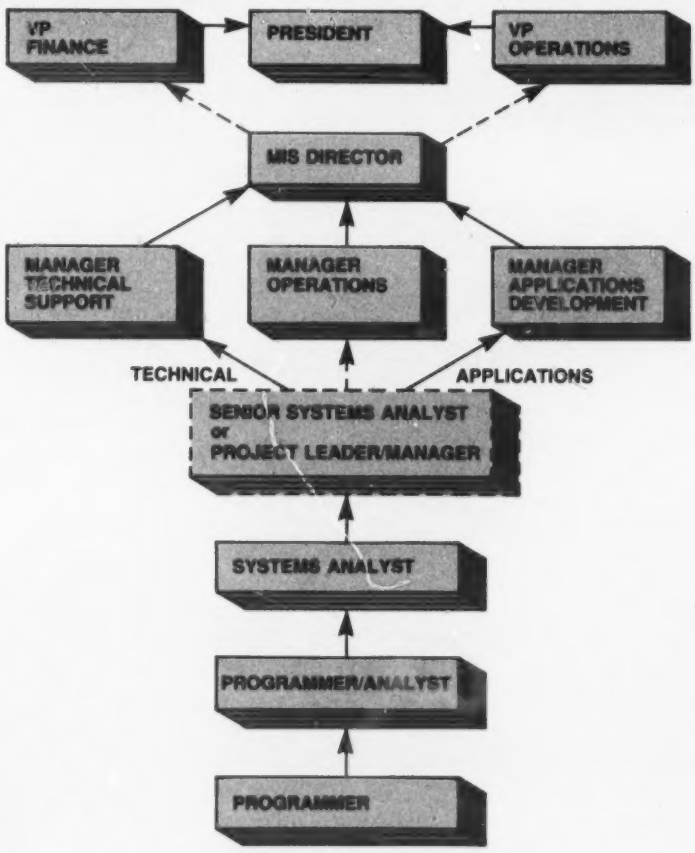
FIG. 2

PARTICIPANTS' DEMOGRAPHICS

	NUMBER OF RESPONDENTS	AVERAGE	RANGE
Age	58	42.2	27–62
Salary	45	44.3	25–100
Years working	58	18.4	6–43
Years in dp	58	12.9	0–35
Years with '83 firm	57	12.4	.3–43
No. of firms	59	2.5	1–8

FIG. 3

POSSIBLE SYSTEMS PROFESSIONAL CAREER PATH



Formal training, on-the-job motivation, and being in the right place at the right time all contribute to career advancement.

Turnover rates for the MIS departments were surveyed when available. Two managers indicated a rate of 10%. One, a bank dp manager, attributed this rate to an educational commitment to provide the dp staff with new skills and career guidance. In separate interviews, his staff confirmed the effectiveness of this program. One director in charge of MIS human resources said that in 1979 his MIS department's turnover was 40%. Because of the economy and the assistance of industrial psychologists, it came down to 8% in 1981 and has remained there. But he thinks this is too low. He believes 10% keeps the department energized; any lower and it stagnates.

Gary left a job because his duties involved external client consultation. He felt he did not belong anywhere. His was a case of turnover to seek identity within an organization and to prevent the feeling of being adrift. Besides changing firms, another type of turnover that dp managers should be aware of is the move to a user area and vice versa, or what we call crossover.

Hal has been in sales order entry, and now he calls it "electronic order entry." He is basically a user but says, "Half of my time is spent on the sixth floor" (dp). Some firms encourage this crossbreeding. Pete and Brian, of different firms, both mentioned systems personnel who had acquired APICS (Association for Production and Inventory Control Systems) certification. Gil, who has a strong technical background, has been reporting to a user area since 1973, but he is a dp coordinator. It is not uncommon for Tom to be a user and have dp reporting to him—he is controller. More unusual is the case of Gary's boss, the vp of finance, who was formerly a systems person but is now a CPA. Curt mentioned clerical workers who used dp skills for upward mobility. Curt thinks it is easier to train a business-oriented person in dp than to teach business skills to a dp person. As a systems manager, Curt actively recruits accountants. Len, a plant engineering supervisor in 1979, now supervises network control in dp operations. He wants to go into purchasing. Brian feels like an expert because he is the token "systems person." A systems liaison to purchasing in 1979, he now manages the area.

Boredom sets in and people start looking. In 1979, when Curt was a systems analyst, he told his boss that he was bored, so his boss gave him more work. That wasn't quite what he had in mind, and he clarified that point with the boss. At 33, Curt is now associate director of information policy and planning after being manager of operations (for which he had no experience or training) at his 1979 firm—a major mining and processing firm with 14 divisions. He is organization and department loyal "as long as MIS is not a dead end."

From our original 59-person sample, nine were in systems and have now switched to user departments and nine others have gone from user areas to systems. These people comprise one third of the study group, and they exude self-satisfaction because of their versatility. They are also nervous about losing their expertise in their former arenas.

CAREER GOALS FOR 1988

For such a short time span, these findings are interesting. In the ever-changing field of MIS, projecting from the past is dangerous. We asked the sample group to project what positions they would like to hold in 1988, regardless of their firms' career path structures. Dan is working on minis for EFT applications. He doesn't care

This Apr
twice the maga
April 15, 1984
DATAM
Technical Publishing

what his title will be in 1988 or if he'll be working on minis. But he does care very much that whatever he works on is state-of-the-art technology. Rob said his 1988 job isn't yet defined, because he hopes it's in an area that hasn't yet been developed.

The two individuals who have deliberate plans to leave the profession by 1988 are now doing maintenance, and referred to it as "criminal work" and babysitting. Their organization is in a depressed industry and their systems group lost 10 members who won't be replaced soon because of user layoffs. One wants to teach, and the other is going to medical school.

Nine former systems staffers who worked in a user area want to stay in it, and four more who have not worked there see it as their 1988 home. Some said that dp is a dead end. One 1979 user, who is now in systems, indicated that he is there only to acquire technical skills. He realized the value of these skills while working on a project three years ago and now supervises some of the systems staff with whom he worked on that project. Another 1979 accountant will stay in dp because of the challenge.

Only one 1983 user wants a 1988 dp home. Few systems people chose the job title directly above their current positions. They either jumped several steps (sometimes out of dp) or made up a title that doesn't currently exist in their company. Apparently, the field has changed so rapidly that it's hard to imagine what lies ahead. The participants in our sample seem to relish this uncertainty rather than be anxious about it. For some, their 1983 job did not exist in 1978 so they look forward to being the first (fill in the blank) in 1988. Most are clearly upward, often through user areas, though two wish to move laterally to acquire more technical skills.

One consensus of the sample was that you make your own career path in or out of the organization. An unexpected response was that another person had pushed or motivated the participants in certain directions. Nine of the participants mentioned one or several people who "wouldn't let me fail," "really believed in me," "told me not to wear short-sleeved shirts," and "taught me how to deal with people." Older role models were perhaps not present in the systems analyst function, but in an advisory capacity mentors were appreciated. In one bank, three participants talked at length of the same person named Howard, who had convinced all three that they were each unique and had enough talent to do anything.

THREE MAJOR FINDINGS

This survey produced three major findings, which I'd like to explore in detail.

First, little evidence was found of formal career paths. Existing informal career paths seem limited in comparison with other occupations or for a group that has such a strong need for career growth. It is possible that a formal career path may not be necessary. Dp personnel who are apparently successful (no measurements were attempted) find a path for themselves. Mark, Curt, Gary, Dana, and Hal had positions created for them. There was no indication whether these opportunities came about through their own initiative or that of a supervisor.

One might ask how career paths can be designed when it is so difficult to anticipate what the interaction of technology and organization structure will be in five years. It is not clear whether the "dead end" on paper is a motivator or a practical constraint. If dp management attempts more counseling and

il, it'll be
zine it is today.

IATION

a year. More vital information. More in-depth features. More timely topics. And *twice* the opportunity to stay ahead of the world's fastest moving business.

The field has changed so rapidly that it's hard to imagine what opportunities lie ahead.

expands its structures, would this be stifling to "the free spirit" (as one dp manager put it) of dp staff? Future MIS directors should assess career development programs as to their effectiveness for retaining key personnel.

The words variety, challenge, growth, and learning kept coming up in the participants' responses. Brian likes to see "barriers broken down." Connie says it is "exciting that the pressure is on and then off." Rhonda says her work is challenging because she is learning, then teaching that skill to someone, then learning and teaching again. Bill says you have to have the temperament to "answer problems while 10 people are leaning over your shoulder." When asked why they have not been lured away, several respondents said they could make the same money elsewhere, but the variety of responsibilities in their jobs keeps them there. Dana says, "Dp people like change. If they don't get it, they change jobs."

Secondly, it was a surprise to find this sample so organization loyal. The maturity of the field is one explanation. Turnover rates in previous years were compiled about people with less dp experience. This vanguard group has both professional and chronological maturity, which can be linked to security needs. Both Don and Mickey (in their early thirties) mentioned pension benefits. Future research should segment age groups and years of MIS experience to better analyze turnover data. A number of the participants expressed gratitude to their organizations for the opportunity to develop what they perceived as the best technical skills. Crossover may explain the unanticipated lack of turnover, but a recession seems to be the opportune time to nurture this loyalty. While some staff members are leery of changing to a new environment, others, in whom organizational commitment is marginal, might become more loyal if development programs were instituted. When the economy turns, employee tenure and management support discourage someone from exploring outside the company.

Third, although this study started out as a survey of systems professionals, it soon became apparent that some participants who reported to a systems area in 1977 were actually users in disguise. In 1983 some systems staff had migrated out to user areas. To complicate matters further, they openly admitted their intentions to switch again! Thus the focus was changed to "systems-related professionals." One former user, now a systems analyst but soon to be a user again, stated, "We won't need systems people in the future." Another said, "The crossover is the way of the future." These two may have lacked objectivity, but even those who are exclusively users or dp people hinted that such chameleons are the ideal systems people and users. Is it possible that we might have systems-proficient users and functional systems analysts?

NEW JOB TITLES IN FUTURE

Past and future trends point toward the user area, indicating career paths that will be difficult for a human resources personnel department to manage. It is likely that a variety of titles will proliferate, if the participants' inability to give a 1988 job title is an accurate indicator. Less clear, however, is whether the migration to user areas is a result of the lack of dp career paths. This is a tempting conclusion to make, but other conditions are worth investigating. For example, the high growth need of systems professionals may direct them to functional areas. Most of the participants stressed the importance of having a systems staff that understands the business environment. Users' computer literacy is inevitably growing with the infusion of micros into the office and home. Their heightened interest in the technical sphere and the desire of systems staff to complement their technical base suggests a blur of systems-related professionals. The systems staff and users in this sample urged young people to work in user areas and supplement technical training with business training to become the ideal systems persons.

A likely scenario for the future information resource department is a small technical staff with a core of trainers that users can call on, headed by a vice president of planning and information. Some firms are already promoting such an atmosphere with the use of information centers. One dp manager commented on losing two of his information center staff to user areas, because dp puts their best communicators in the center. Instead of worrying about a loss of power base, the MIS director might plant the best systems analysts in key user areas (an example of internal turnover). This infiltration strategy puts the MIS director in charge of the information resource and proves to the firm that information is a major asset. The crossover trend could lead to the day when all users are systems proficient, and the systems analyst of today is no longer necessary. That would solve the shortage problem without waiting for MIS and CS programs to produce trained technicians.

MIS management should assess the opportunities available for their staff, their users, and themselves. Some firms have encouraged this internal turnover from systems to the user area and vice versa. Perhaps it is too soon to evaluate whether these experiments are successful in filling the gap in skilled personnel. On the other hand, it may be too late to experiment once the staff is lost. In September 1978, DATAMATION carried an article by Jac Fitz-enz, entitled "Who Is the Dp Professional?" In 1988 we might walk into a user area and ask, "Who is the real dp professional?" ●

CARTOON BY LEO CULLUM

Kate M. Kaiser is assistant professor, MIS, with the University of Wisconsin-Milwaukee. Prior to this position, she taught MIS at McGill University in Montreal. Dr. Kaiser began her dp career in 1967 as a keypunch operator on second generation equipment at Kent State University.

The PBX is transforming the telecommunications world in Europe.

HOLD THE PHONE

by Paul Tate

From words in waves to data by the bit, the world's telephone systems are undergoing the most radical change in their 100-year history as they make the switch from the analog to the digital domain.

Perhaps the most significant result of that change is the development of the digital private branch exchange (PBX), a highly sophisticated communications processor that functions as a telephone switch. Capable of integrating voice, data, text, and image, the digital PBX can transform an internal telephone system into a strategic communications network at the forefront of a company's operation.

European PBX shipments are expected to total $3.4 billion by 1986, according to researchers at Frost & Sullivan. Hoping to make some of those lucrative shipments are a plethora of computer and communications companies that are scrambling for a foothold in the once-fledgling market. "The European PBX business is certainly heating up," confirms Northern Telecom's vice chairman Basil Beneteau. "It [Europe] may be five years behind the U.S. in the use of digital systems, but the competition is fierce and the markets are opening up." Northern Telecom is in fact one company that's putting its money where its mouth is. To support its European operations, the PBX producer has invested $10.5 million in a U.K. development and production center.

Not everyone would agree with Beneteau's assessment of the European PBX market. Wolfgang Swartz, president of Rolm's international telecom division, calls the market "stifling and restricted. Look at the way the German Bundespost operates as a PTT," he complains. "It tells you what size system you can sell, what the architecture should be, and what services you can offer."

The European PTTs have traditionally maintained tight control over their national telecommunications markets. They've achieved this tight control by dictating technical standards, by imposing marketing strategies, and by using their monopoly positions to foster the growth of the local industry. Some of those protective barriers, however, are now coming down and there is an international rush to get a foot in the door as these markets become more open.

FIG. 1

WEST EUROPEAN PBX MARKETS

	PBX EXT	1982	1986	Total % growth
WEST GERMANY				
Installed Systems	<100	131,670	151,400	15.0
	>100	17,750	20,600	16.0
Shipped Systems	<100	12,360	15,600	26.2
	>100	1,508	1,920	27.3
FRANCE				
Installed Systems	<100	80,122	91,587	14.3
	>100	10,900	12,510	14.8
Shipped Systems	<100	7,080	8,030	13.4
	>100	890	1,025	15.2
U.K.				
Installed Systems	<100	105,700	116,770	10.5
	>100	4,472	4,936	10.4
Shipped Systems	>100	9,470	12,100	27.8
	<100	420	509	21.2
ITALY				
Installed Systems	<100	62,850	70,295	11.8
	>100	3,580	4,060	13.4
Shipped Systems	<100	5,285	5,870	11.1
	>100	275	300	9.1
NORDIC GROUP				
Installed Systems	<100	13,600	16,400	20.6
	>100	4,630	5,780	24.8
Shipped Systems	<100	1,560	2,500	60.3
	>100	460	530	30.5

SOURCE: PACTEL

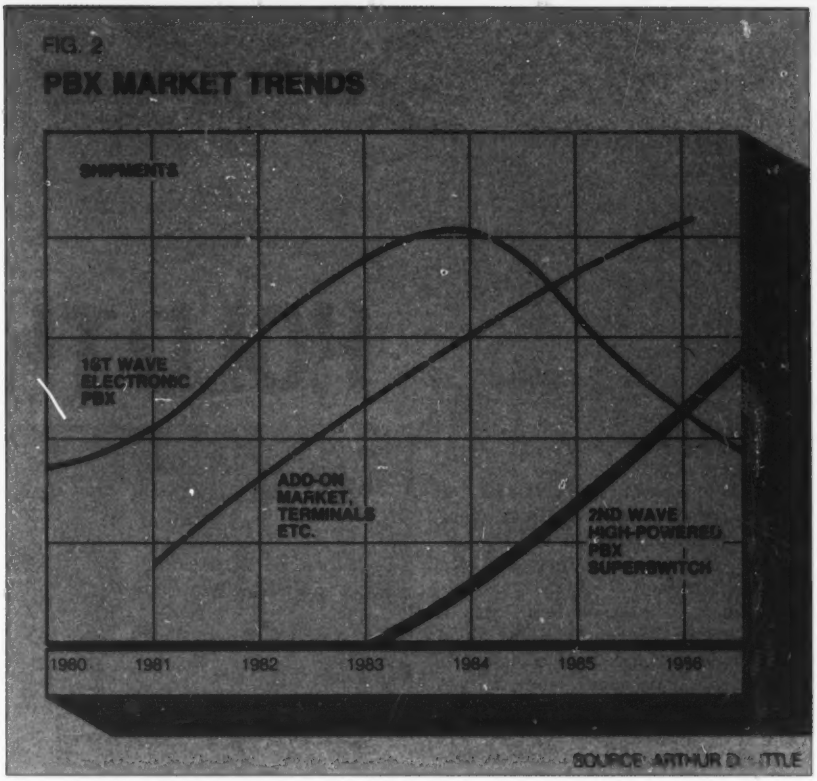
What has helped unlock that door is the rapid advances in computers and communications—advances that have led to the long-awaited merger of the two technologies. And it's this technological convergence that carries enormous implications for both the industry and the marketplace.

"The convergence is literally redefining the telecommunications industry," declares AT&T chairman Charlie Brown. "We're talking about a whole new range of possibilities for communicating and handling information—possibilities that can enhance the productivity and effectiveness of individuals and businesses."

At the center of that convergence is the PBX, which has also undergone some dramatic changes. "The fact is that nobody is selling a simple PBX anymore," says Olof Lenneman, PBX sales manager for Ericsson Information Systems. "What they are selling is the heart of a complete office system."

THE PBX's PIVOTAL ROLE

The pivotal role the PBX is destined to play in the development of an internal office network has not escaped the notice of dp and telecommunications companies. "The PBX sale should lead



to account control," explains Richard Miller of Cimost Inc. "That is one reason why IBM has made such determined efforts to enter the PBX business."

John Hooley of Plessey in the U.K. believes that part of that trend can already be seen in the marketplace. "Five years ago 90% of the value of a PBX sale was in the central system itself. Now that has dropped to 40%, with 15% in maintenance and the other 30% in the supply of terminals and add-on functions."

A closer look at today's PBX market shows why this is happening. Although a number of integrated PBXs are currently on the market, there is still a strong demand for the earlier electronic switches that can also support limited data functions. Users, encouraged by the PTTs, are willing to ditch their old strowger and crossbar switches for new electronic systems, but they don't feel it's necessary to make the quantum leap to a fully integrated exchange.

"It is a very pragmatic approach," comments Arthur D. Little consultant Roger Camrass. "Unless they are sophisticated network users, most people will not change just because there are fully digital switches around. Many people will stay with established electronic PBXs and simply add data functions."

It's also true that 85% of a PBX's work still involves voice traffic, and cost overheads may be incurred in providing sophisticated data handling on only 15% of the lines. As the suppliers push the sale of add-on functions and users fill up existing switch capacity, the need for more functionality in the switch itself increases. That is when the real market for integrated switches will develop, but that's still a few years away.

Vendors, on the other hand, must encourage the use of those terminals and add-on functions to cut down the life cycle of the older switches. That life cycle is already on a downward spiral. Alan Knight, head of Logica's telecom division, estimates that the life span of a PBX has plummeted from 15 years to around seven years.

These dramatic shifts in the structure of the PBX business are fostering increased international competition between suppliers in both the dp and telecommunications industries. In Europe that competition underscores the need for more open markets, markets that allow local users to have access to new technologies. In a recent report on "Communications in Europe," U.K. consulting firm Logica concluded that "there can be no doubt the general trend has been towards liberalization in European markets, and that policy seems set to continue in the same direction for the foreseeable future. The implications are clear enough: there will be increased opportunities for independent suppliers of equipment and services." Logica, however, also believes that "PTT purchasing policies will remain strongly nationalistic and changes are likely to be largely cosmetic."

Despite their nationalistic tendencies, some European PTTs are becoming more amenable to the idea of buying systems from foreign suppliers, especially for resale. In the U.K., for example, Canadian company Mitel supplies systems to British Telecom. Further north in Sweden, Northern Telecom has a licensing agreement with an arm of Televerket, the local PTT.

PTTS LET OUTSIDERS SELL

More important, the PTTs have displayed increased willingness to let outside companies sell systems directly to end users. And there is obviously no shortage of suppliers who want a piece of that action. Many vendors have been particularly attracted to the U.K. market, where the liberalization of the telecommunications industry is seen as a stimulant to economic growth. Much of that liberalization came as a result of the British Telecommunications Act of 1981, which stripped British Telecom of many of its monopoly powers. On the PBX front, BT's monopoly over small switches under 100 lines was finally curtailed last July. (Larger PBXs have always been available from private industry.)

Nevertheless, British Telecom is still a major factor in the marketplace. BT, which has become more market-driven in the wake of deregulation, maintains a strong PBX line based on GEC, Plessey, and Mitel equipment. Outside suppliers still need to get equipment approval, but only interim authorizations are currently available. The final okay will come from a new independent body, the British Approval Board for Telecommunications, which is being set up to counter allegations that BT could use the approvals process to its own commercial advantage.

Following the same tack, the Deustche Bundespost (DBP) in West Germany has established a separate approvals department, the Zentralamt fur Zulassungen Fernmeldewessen (ZZF). The DBP claims the ZZF is completely independent from its other operations.

The DBP, which labels itself liberal, is still considered to be one of the strongest PTT monopolies in Europe. In the PBX realm, it supplies around 50% of systems, mostly at the low end. Of the indigenous German PBX manufacturers, Siemens is well ahead of the pack, with about 80% of its PBX sales going directly to end users. Nonetheless, the DBP, which controls technical specifications and market prices, remains a stumbling block in that West German marketplace.

SWIFT APPROVAL PROCESS

In France the national PTT, the Direction Générale des Telecommunications (DGT), does not supply any PBXs, and its approval process for equipment from independent suppliers is relatively swift—around a year. There are still problems, however, for outside suppliers. "On paper there are no restrictions to entering the French PBX market," says Roberto Rochio, the director of operations for Olivetti's tele-

FIG. 3

MAIN PBX SUPPLIERS IN WESTERN EUROPE

U.K.	WEST GERMANY
Plessey	Siemens
GEC/Northern Telecom	Telefonbau und Normalzeit (T&N)
Philips/Rockwell	Te Ka De/Philips
STC Business Systems/ITT	Standard Elektronic Lorenz/ITT
ICL/Mitel	De Te We (Siemens associate)
Ferranti/GTE	IBM
Thorn Ericsson	Nixdorf
Harris	Ericsson
IBM	
FRANCE	**ITALY**
CIT Alcatel/CGE	Italtel
Jeumont Schneider	FACE/ITT
Thomson CSF	FATME/Ericsson
CGCT/ITT	GTE
Matra	Philips
SAT	Telettra
IBM	Olivetti/Northern Telecom

communications division Olteco, "but France is a very difficult place to do business."

Philippe Picard, head of the DGT's industry division, feels that such criticism is unjustified. "France does not have a very liberal image, but in fact the market for PBXs is very open and competition is fierce. I think the reason many foreign suppliers are not interested in selling here is that prices in France are around 20% to 25% lower than in Germany, for instance."

The French have done a great deal in recent years to stimulate their telecommunications industry and update their national telephone system. This should finally quiet the critics who claim that half of France is waiting for a telephone, while the other half is waiting for a dial tone.

The passion for nationalization in French industry has resulted in the proposed merger between Thomson-CSF's telecom division and the CGE arm of CIT Alcatel. The Thomson company, which is especially interested in the PBX market, has just launched its Opus 4000 digital PBX. Competing with Thomson is Jeumont Schneider, probably the most significant PBX supplier in France. The firm has over 36,000 systems installed, which represents around 37% of the market.

In contrast to the DGT's hands-off attitude toward PBX sales, Italy's state-controlled telephone body, Societa Italiana per l'Esercizio Telefonica (SIP) is a major player in the Italian marketplace. SIP maintains close links with Italtel, which supplies around 50% of the local PBXs. Elsewhere in Europe, the PTTs' PBX involvement varies. Both Sweden and the Netherlands have strong monopolies in the PBX business, while Spain, Austria, and Belgium take a more liberal view of outside suppliers.

Most PBX vendors in Europe are either local companies or North American firms that harbor hopes of breaking into the market. Obviously, the Europeans have a head start over their transatlantic rivals. One reason is that they understand the different local telecommunications markets. They also do not face the same technical problems that the North Americans do in adapting machines for those markets.

Those technical setbacks, which can be significant, fall into two main categories—Europe-wide standards and national requirements. Northern Telecom's Beneteau comments that in adapting a North American product for the European market, "you find that 70% of the changes are 'core' changes, and the rest depend on which national market you are aiming at."

Logica's Knight says two technical changes are needed for the European market. He explains that while Europe and the U.S. use a 64Kbps transmission speed, the coding laws for converting analog signals into 8-bit computer words are different in Europe. Secondly, the interface between the trunk network and the PBX must be changed, because Europeans use a different method of multiplexing. In Europe the standard is 30 × 64Kbps for a 2Mb bit stream, while in the U.S. 24 × 64Kbps gives a 1.5Mb bit stream.

The design of a PBX clearly affects the ease with which it can be adapted. When European suppliers such as Ericsson design a switch, they make sure it can be adapted to national requirements. North American suppliers are beginning to catch on. An AT&T spokeswoman claims that the company's Dimension 85 PBX has built-in flexibility, having been designed with "international markets in mind."

Coping with the technical problems is one thing. Coping with entrenched competition is another story altogether. Some of the local European suppliers have been content to concentrate on their national markets. Other companies such as Ericsson, Siemens, and Philips have successfully branched out into foreign markets. All three companies have worked through local subsidiaries, distributors, and partners to attack these markets.

TRYING TO BROADEN BASES

Many other European companies are also trying to broaden their domestic bases. The newly formed Thomson-CGE team in France is searching for partners; the U.K.'s Plessey is trying to get Burroughs to incorporate the company's IDX digital exchange into its product line; Nixdorf plans to take its in-house-developed PBX into foreign markets once it has made some headway in Germany; and Olivetti is looking for a digital switch it can add to its foreign product portfolio.

AT&T is also exploring ways to break into the European PBX market. It is keeping its options open, however, and is considering selling its Dimension 85 PBX through PTT and independent supplier channels. The system, which is selling well in Greece, is up for approval in the U.K. and Germany.

AT&T International is playing its European marketing cards very close to its chest. "We are treating the European market with a great deal of respect," explains a company spokeswoman. "We realize that our European competitors have probably forgotten more than we know about how to sell here." The company is anxious to recruit European partners to make up for this lack of experience. Its initial deal with Philips only covers public switching systems. Industry observers feel that the rumored tie-up with Olivetti could help give the company the marketing boost it needs in Europe.

Other North American companies like Northern Telecom and Mitel have had varying degrees of success in Europe. But the main contender from across the ocean still appears to be IBM-Rolm.

IBM certainly has the kind of European marketing presence that could make it a serious contender in the PBX arena. Nevertheless, Ericsson's Lenneman says he is not all that worried about the IBM threat. "On the surface, the IBM and Rolm partnership is very dangerous, but IBM has a serious problem in the PBX market. It has tried to sell its systems for the last 10 years with very little success. The Rolm agreement is almost an admission of this."

Telecom experts don't believe IBM will even bother introducing the Rolm PBX in Europe. Instead, they think the mighty company will get more marketing leverage by linking up with a European PBX supplier.

All this intense competition points to one thing—the importance of the PBX in the overall telecommunications marketplace. Transformed by the convergence of computer and communications technologies, the telephone system is no longer simply a conversation piece, it is the linchpin in tomorrow's telecommunications networks. ❖

Oems and SIs say their hardware spending will increase 29%, with personal computer shipments up 117%.

1984 MARKET FORECAST

by John W. Verity

Judging by the way they perceive their on-hand inventories of minicomputer hardware, oems and systems houses are looking forward to their business picking up substantially in coming months.

After a year of extremely soft pricing, sluggish overall sales, and the encroachment on traditional minicomputer turf by the now ubiquitous microcomputer, oems and systems houses indicate a sharp decline in their inventories, according to a survey taken last summer by Cowen & Co., a Boston research firm, and DATAMATION.

Completed questionnaires from more than 7,700 data processing managers and oems were received. The survey results include reports from more than 6,000 dp sites and 560 oems, systems integrators, and other value-added remarketers.

While inventories for oems and systems houses had grown in previous surveys to 3.5 months in 1982 from 2.6 months in 1979, this year's number was 2.8 months. Breaking the data down further, the survey showed last year's length of supply for oems at 4.0 months dropping to 2.5 months this year. Among systems houses, the drop was to 2.9 from 3.2 months.

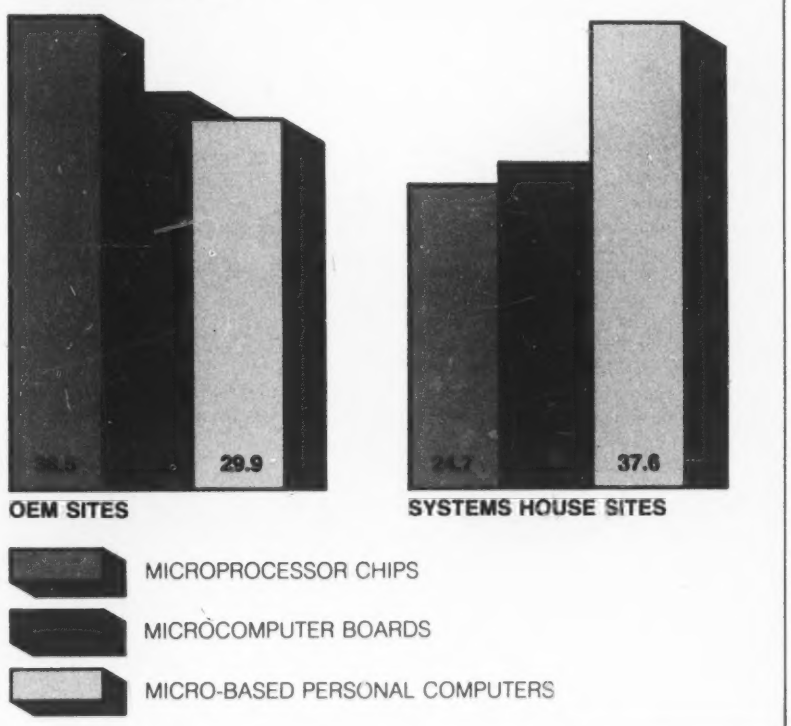
In other words, it looks as if the product pipeline will soon be refilled as orders come in and inventories are replenished, according to Cowen analysts.

The shortening of inventories comes mainly from the commercial side of the business, which is showing much more activity than technical markets. For instance, those oems and systems houses selling standalone business systems indicated an average of 2.5 months of hardware on hand, while those selling medical/biophysical lab analysis systems said they had about 6.5 months of inventory in-house.

This definite uptick in the expectations of oems and systems houses is a refreshing change from the rather dim sales environment experienced in past years. This group of systems remarketers is apparently losing some of its importance to the minicomputer industry as vendors beef up direct sales forces and move product through new, higher-volume sales channels.

FIG. 1

MINICOMPUTER OEM/SYSTEMS HOUSES TURNING TO PCs



Asked if their organization had canceled or delayed any deliveries of hardware, oems and systems houses also said there was a decrease compared to last year. Only 9.6% of responding oems and systems houses this year, compared to 14.4% last year, said they had already delayed or canceled deliveries. Only 1.1% this year said they expected to do so in the foreseeable future.

Pricing of minicomputer hardware had been soft in past months, as vendors struggled to stimulate sales. Systems houses and oems each indicated a drop in the number of respondents who indicated that they had received no price discount on the last system they had purchased.

Especially aggressive pricing was indicated by respondents who had purchased equipment from Prime Computer, followed by those doing business with Texas Instruments, Digital Equipment, and Hewlett-Packard.

The survey found that spending for minicomputers would be up 13.9% in 1984 compared to the year before. That rise is up slightly from the 12.5% figure recorded in

CHARTS BY CYNTHIA STODDARD

Oem shipments of PCs will exceed minis, in terms of dollars, in a few years.

last year's survey, but nowhere near the 23.5% growth seen in the 1981 survey.

Most of the acceleration in mini spending is attributable to oems and systems houses, who together indicated their spending would rise by 28.7% through June 1984. End-user buyers indicated only a 10.5% rise in spending.

Of the overall spending on minis, the traditional minicomputers' share is expected to fall while standalone business systems will gain slightly. In a comparison of purchases from July 1982 through June 1983 with expected purchases from July 1983 through June 1984, the numbers work out as follows: traditional minis from 64.7% to 61.5%; small business systems from 22.3% to 24.8%; data entry systems from 6.4% to 6.8%; office systems from 5.3% to 5.6%; and intelligent terminals maintaining a 1.3% share.

MINI SLOWDOWN DUE TO PC

A substantial part of the slowdown in minicomputer purchases can be attributed to the rapid growth in personal computers, which are taking over from shared minis in many applications. As opposed to minicomputer shipments, which will rise only 13.9% in the coming year, the survey finds personal computer shipments will grow by a whopping 117%. Indeed, for the year ending June 1984, the split between minis and PCs in terms of respondents' purchase dollars was 26% to 74%. Hence, the survey analysts suggest that shipments of PCs will exceed the minicomputer in terms of dollars in two to three years.

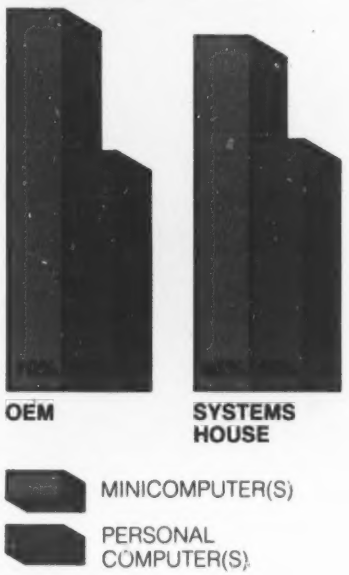
Spending expectations for 1984-85 are still downbeat among oem respondents but improving for systems house sites. Fully 50% of the oem respondents said their spending for the year ending in June 1985 would be higher than that for the previous year, compared to a similar figure of 54% recorded in last year's survey. Among systems houses, on the other hand, this year's survey found a comparable number, 46% this year, up from 43% last year. Nevertheless, neither figure was up to the forecasts taken in 1981, when oems saw spending rising 62% and systems houses saw it up 57%.

Those applications sectors forecasting the most growth in purchases of minicomputers are manufacturing, retail/wholesale distributors, and government.

In the all-important 32-bit minicomputer market, Digital Equipment's share is still the largest, at about 67% of survey respondents, but its growth in the market is leveling off. Data General, with its MV series of machines, appears to be gaining market share, particularly as its high-end MV/10000 competes vigorously with DEC's aging VAX-11/780. Data General's share of the respondents' 32-bit purchases will grow to an expected 10.3% in the 18 months ending December 1984 from 6.4% in the year ended June 1983.

FIG. 2

PERCENT OF MINICOMPUTER USERS PURCHASING PCs



Six years after its introduction, the VAX-11/780 makes up 68% of respondents' total VAX purchase dollars, compared to 27.2% for the model 11/750 and only 3.4% for the 11/730. The question DEC must be facing, therefore, is how much impact will its upcoming VAX models have on the installed base?

Among DEC minicomputer sites, fully 85% of purchase dollars will go to 32-bit systems in the 18-month period ending December 1984, compared to 61% in the similar period ended in June 1983. For Data General sites, however, the growth will be even greater, moving from 29.2% for 32-bit machines in the first time period to 57.6% in the latter 18 months. For DEC, of course, this means the migration of its user base from 16-bit to 32-bit systems will be over in a few years while Data General appears to have a longer migration period to look forward to.

Prime Computer's big seller has been the model 750, which in the 18 months preceding July 1983 captured 40.7% of respondents' Prime purchase dollars and 33.6% of their unit volume. Looking ahead 18 months, however, Prime users indicated they would be boosting their share of dollars going for Prime 2250 machines to 26.9% from 3.5%, compared to the 750's slipping to 32.8% from 40.7%. The model 850, too, looks as if it will slip to 12% from 25.1% of dollars spent.

IBM, DEC LEAD DDP MARKET

In another subdivision of the mini market, distributed processing, IBM and DEC are clearly the winners. Together they will capture half the ddp business planned by survey respondents: IBM with 42% and DEC with 18%. Datapoint, on the other hand, is losing market share swiftly, dropping to a 1.1% share of planned expenditures.

In the operating systems arena, particular attention was paid to AT&T's Unix package, which has been gaining steam in recent months but which has yet to dominate the marketplace. So far, its usage among survey respondents is limited largely to users of DEC machines. About 68% of the Unix users surveyed were running DEC equipment, followed by 4.3% running IBM systems, and 3.2% each for Data General and Hewlett-Packard. Among those planning to install Unix some time in the 18 months ending in December 1984, the highest growth was seen among IBM and HP sites.

Out of the total survey population, only 4.1% were using Unix at the time of the survey, but some 15% said they planned to install it in the coming 18 months. The outcome of that migration may mean, of course, that DEC's VMS and other proprietary operating systems will suffer as Unix use spreads through minicomputer sites and its spin-offs such as Xenix find acceptance in the personal computer marketplace.

Unix's penetration of the marketplace will be particularly strong in DEC, Perkin-Elmer, and Gould/SEL sites, followed by sites running hardware from Harris, Prime, and even NCR machines. And, of course, Western Electric's own line of Unix-based minicomputers is becoming a factor in the mini marketplace, although in this survey the machines were in use solely within the Bell System.

Unix's penetration of various industry sectors showed particular strength in education, where the operating system was nurtured for many years, and in military/aerospace and scientific/engineering sites. At the bottom of the list, as might be expected, were office systems and business data processing, where Unix has yet to make a significant penetration.

The minicomputer's battle with the personal computer appears to be a losing one in some respects, but more oems and systems houses indicated they were planning to pur-

The Unix operating system will be adopted by 15% of dp managers over the next year.

chase minis than personal computers in the year ending June 1984. Fully 70% of the oems responding said they would be purchasing minis while only 44% of those said they would purchase personal machines. Among systems houses, 65% planned to buy minis compared with 46% buying personal computers. The moral of the story is that oems and systems houses continue to be a major factor in the minicomputer marketplace, adding value and service to otherwise raw machines and helping customers by providing industry-specific solutions to their problems.

Nevertheless, about two fifths of the oem site respondents said they buy microprocessor chips, 32% said they buy microcomputer boards, and 29.9% said they buy personal computers. Among systems houses only a quarter of the sites buy microprocessor chips, 26% buy boards, and 37.6% buy personal computers. Intel again leads the microprocessor purchases of survey respondents, capturing 47% of the chips purchased through June 1983. It is followed by Motorola with a 33% share and Zilog with a 14.7% share..

That ranking promises to remain the same, although Intel's share of unit purchases will rise to 52.8%, Motorola will drop to 26%, and Zilog will go up to 18.1% in the year ending December 1984. Intel's strength comes primarily from the 8088 chip, chosen by IBM for its popular line of personal computers, while Motorola's sales are with the 68000.

In the personal computer marketplace, software availability is still by far the most important criterion for choosing a machine, according to the survey. It ranked tops with 63.8% of total mentions compared to 48% for compatibility, 41% for price, and 41% again for product reputation. Such items as ease of learning, graphics capability, and disk capacity were least mentioned by end users. The point here appears to be that IBM's dominance in capturing newcomers to the corporate personal computer marketplace makes it necessary for others to offer some kind of software compatibility in order to take advantage of the large numbers of software authors aiming their efforts at the IBM machine.

No doubt IBM's reputation has helped it sell its P.C., a fact reflected in the survey's finding that IBM is particularly strong among large corporations where centralized purchasing is the norm. But shelf space at retail outlets remains important for IBM and Apple in particular. While DEC and HP personal computers seem to be purchased more often directly from the manufacturer, IBM and Apple systems were cited as being bought predominantly at independent stores.

"Be on your guard. It turns out this is some sort of fund-raising event."

CARTOON BY SIDNEY HARRIS

VAX-11/780 HEADS MINI LIST

Heading the list of the top 10 minicomputer systems for the 18 months ending July 1983 was the DEC VAX-11/780, in terms of the number of survey respondents acquiring it. Out of just over 7,000 total respondents, 292 sites acquired VAC-11/780s (an average of 1.6 machines per site), followed by the VAX-11/750 and two other DEC machines, the PDP-11/23 and 11/44.

In terms of number of units being acquired by respondents, IBM's Series/1 once again topped the list. Respondents indicated they had acquired 1,501 units at an estimated purchase value of $86.8 million. This is the fourth time in this annual survey that IBM's Series/1 mini has been number one. It was followed by DEC PDP-11 machines of various models and the General Automation 16/2XX series.

Projections through the end of 1984 indicate that the top minicomputer in terms of respondents' stated acquisitions is again the VAX-11/780, which is to be acquired by 247 sites. It is followed by the IBM System/36 (to be acquired by 195 sites) and the VAX-11/750. In terms of number of units to be acquired, the IBM Series/1 is once again on top. Respondents said they planned to acquire 961 of those machines, at an estimated value of $41.2 million. The next system on the list is the Microdata Reality 4000, of which 540 units will be acquired at a total value of $13.5 million. Respondents to the survey also said they would acquire a total of $132.2 million worth of VAX-11/780 machines and 48 Data General MV/10000 systems worth $14 million.

The IBM System/36 is clearly the winner in the minicomputer market, taking advantage of the tens of thousands of System/34 machines already installed. IBM appears set for a meteoric growth with that new machine.

NOTE

ONLY THE FOLLOWING PAGES OF THIS

PUBLICATION HAVE BEEN FILMED

Cov. 1, p. 3, 200-3-200-5.